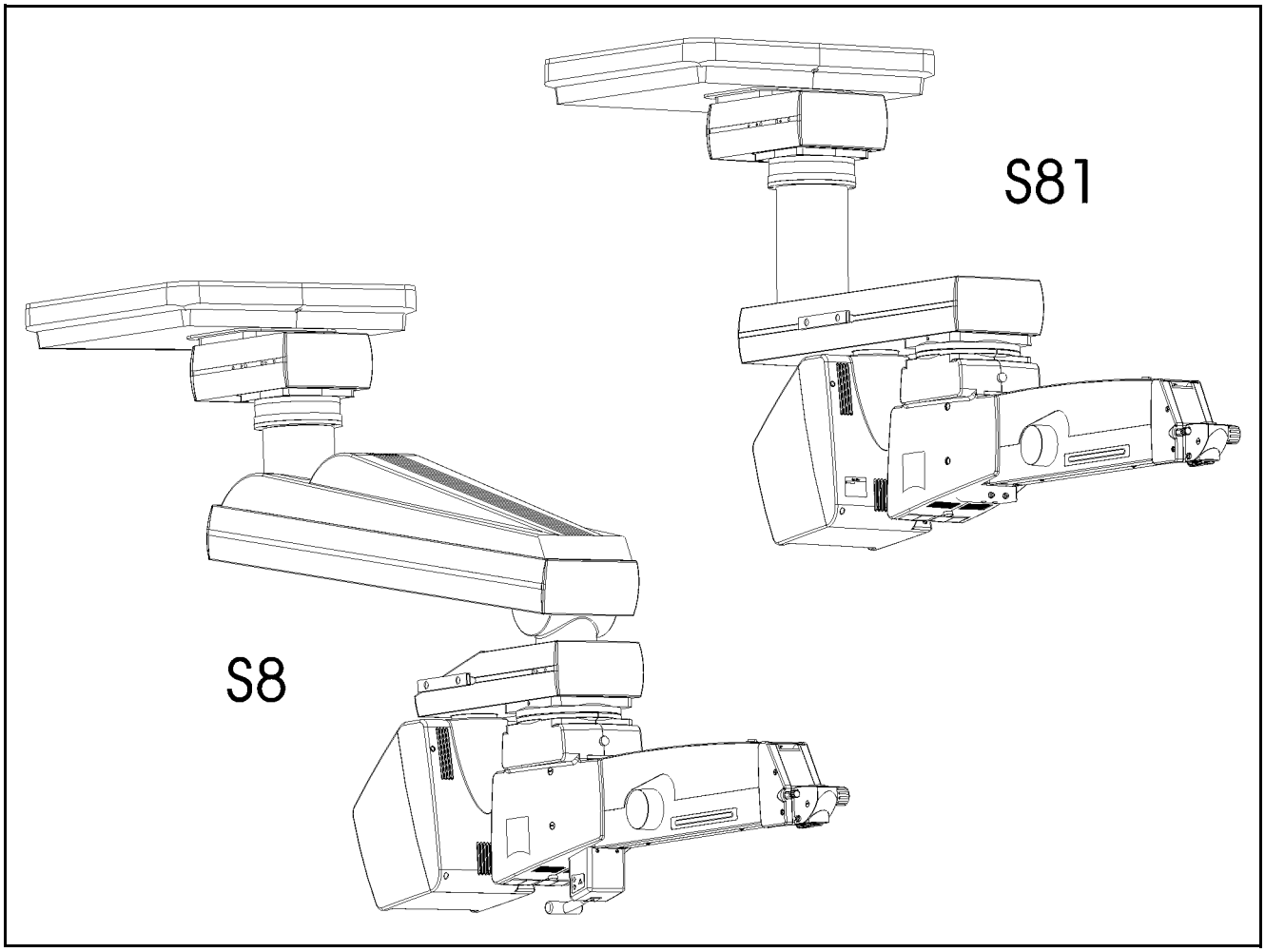
S8 / S81 Ceiling Mounts



Planning Manual

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ZEISS

Key to symbols

Warning!
The **warning triangle** indicates potential sources of danger which may constitute a risk of injury for the user or a health hazard.

Caution:
The **square** indicates situations which may lead to malfunction, defects, collision or damage of the instrument.

Note:
The **hand** indicates hints on the use of the instrument or other tips for the user.

Contents

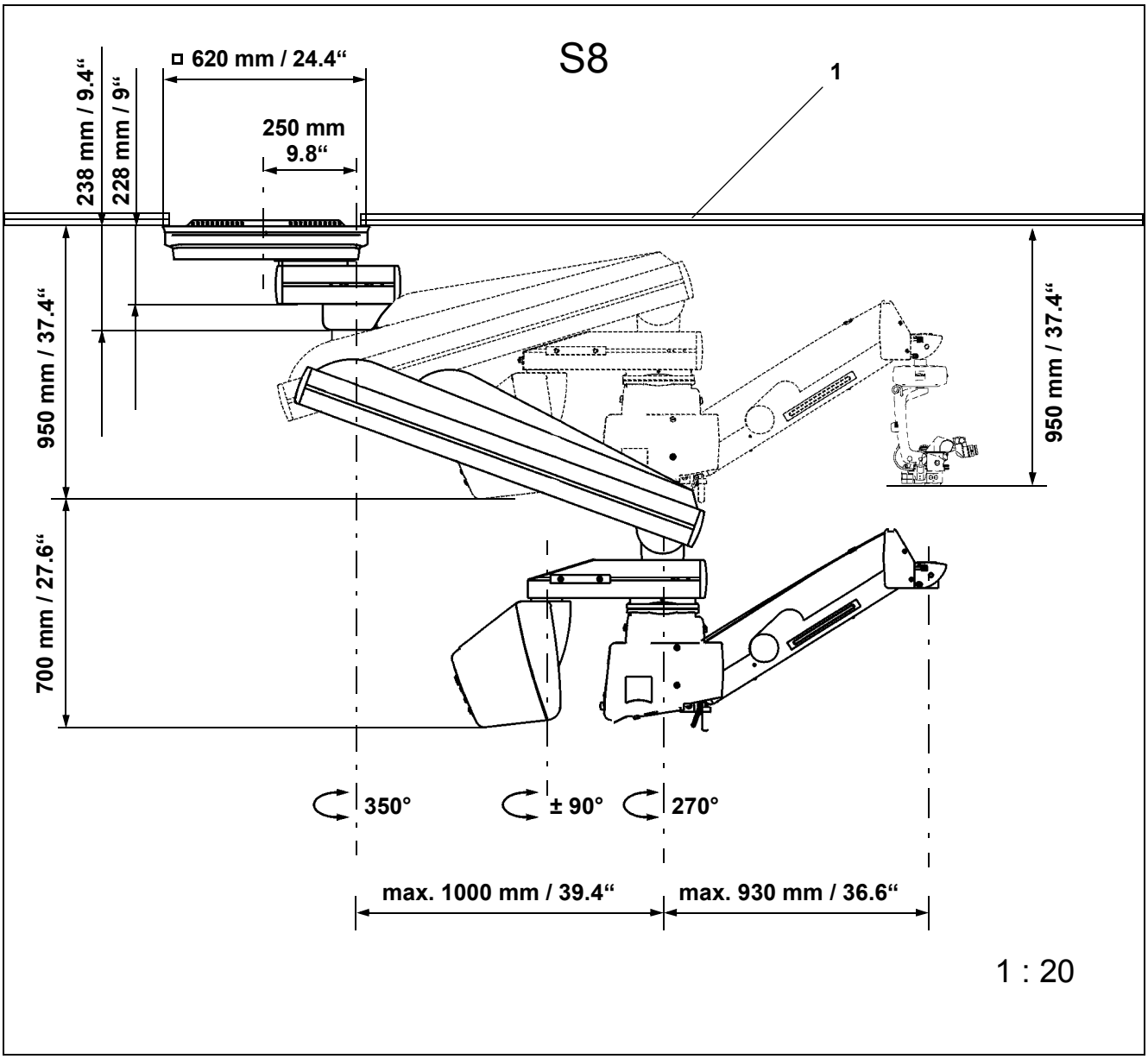
New installation of S8 / S 81 ceiling mount

Technical data

S8 ceiling mount, dimensions

Key

1 False ceiling



S81 ceiling mount, dimensions

Key

1 False ceiling

2 Floor

A Distance A is specifically defined for each project.

B Distance from floor

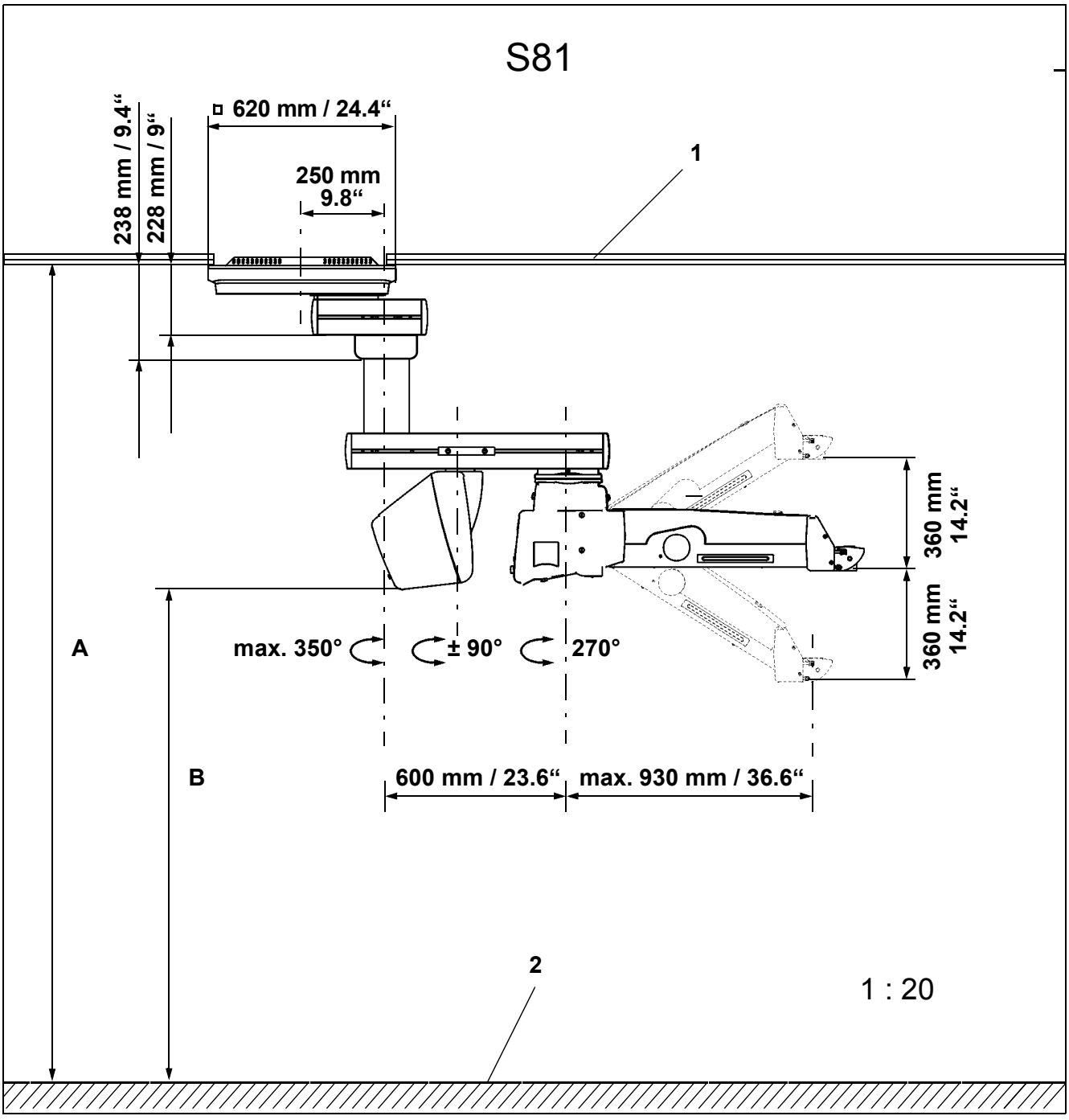
We recommend different distances from the floor, depending on the application involved.

– ENT 1,650 mm (65")

– ophthalmology 1,800 mm (70.9")

– reconstructive and plastic surgery 1,800 mm (70.9")

– others 1,650 mm (65")


S81
620 mm / 24.4“
250 mm
9.8“
238 mm / 9.4“
228 mm / 9“
1
360 mm
14.2“
360 mm
14.2“
A
max. 350°
± 90°
270°
B
600 mm / 23.6“
max. 930 mm / 36.6“
2
1 : 20

Pre-installation set

Key

1 Stud bolt

2 Spacers

3 Ceiling anchor plate

4 Floor

5 Ceiling panel

6 Mount flange

7 False ceiling

8 Interface plate

9 Structural ceiling

A is the distance between the structural ceiling and false ceiling.

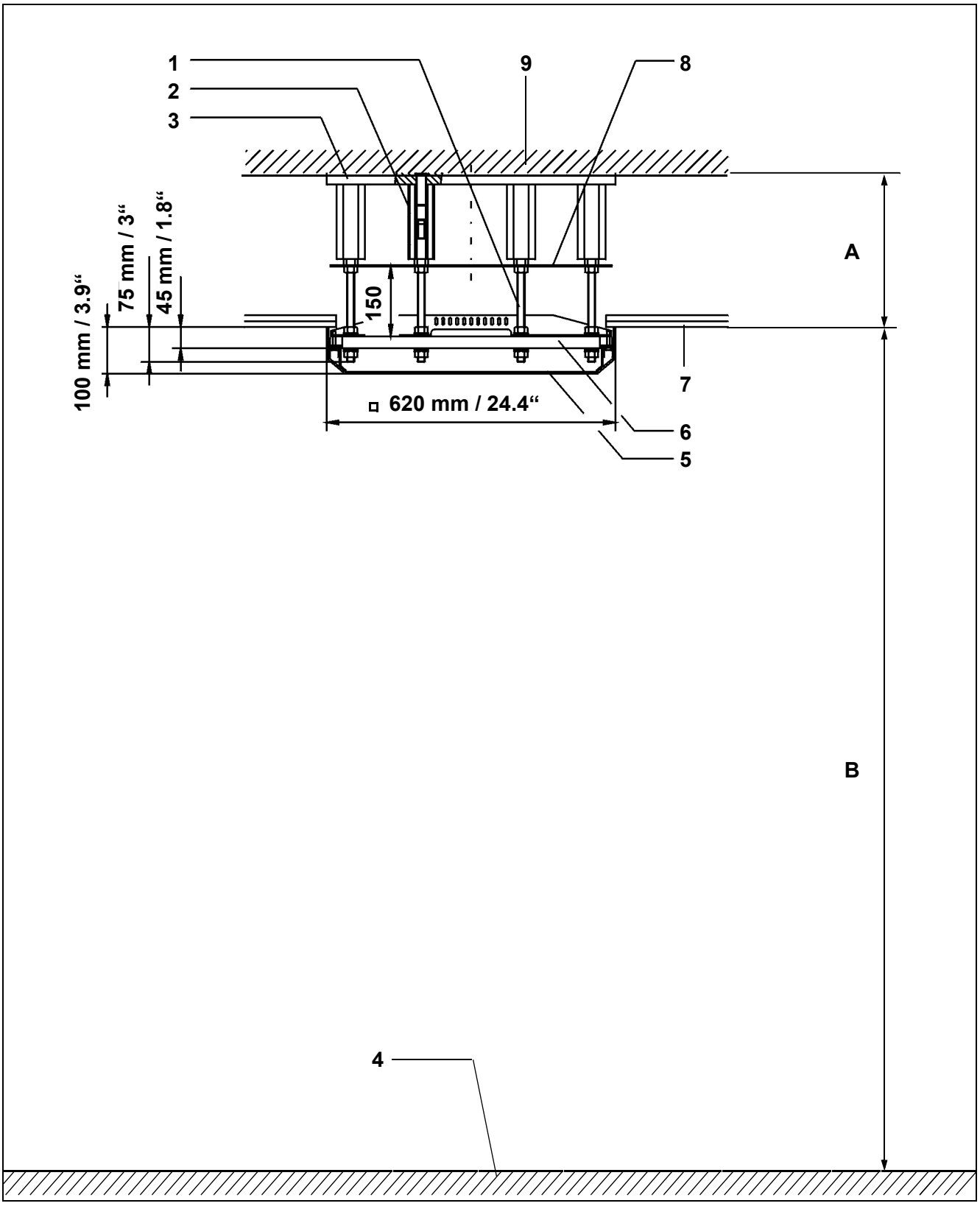
B is the distance between the floor and false ceiling.

Mount flange (6) and ceiling panel (5) are part of the ceiling mount and are only shown here for information. They are not included in the pre-installation set.

A dummy cover is available for closing the opening in the false ceiling until the ceiling mount is installed. Also see page 48 and page 52.

Caution:
When calculating the forces / torques applied to the structural ceiling, the maximum load, i. e. the weight of the ceiling mount itself and the maximum weight of equipment attached to it, must be taken into account.

Note:
Dimension (A) must not exceed 800 mm (31.5"). Otherwise, a ceiling substructure must be installed to bridge the excess distance. When designing the substructure, make sure it is strong enough to withstand the bending vibrations caused by the arms of the ceiling mount.


1
2
3
9
8
A
75 mm / 3“
45 mm / 1.8“
100 mm / 3.9“
150
7
620 mm / 24.4“
6
5
B
4

Installation position in the OR

The optimum installation position of the ceiling anchor plate is dependent on the required position of the operating table in the OR. The following overview shows the ceiling mounts in their optimum operating positions.

We recommend installing the ceiling anchor plate above the area of the patients' feet.

Alternatively, the ceiling anchor plate can be installed laterally to the operating table. Please see the illustration for the recommended distances of the ceiling anchor plate from the surgical field.

In unfavorable on-site conditions, it may not be possible to implement the installation in the recommended positions. Installation options for cramped conditions are shown from page 16 onwards. OR illuminators can only be used with restrictions or not at all in this case.

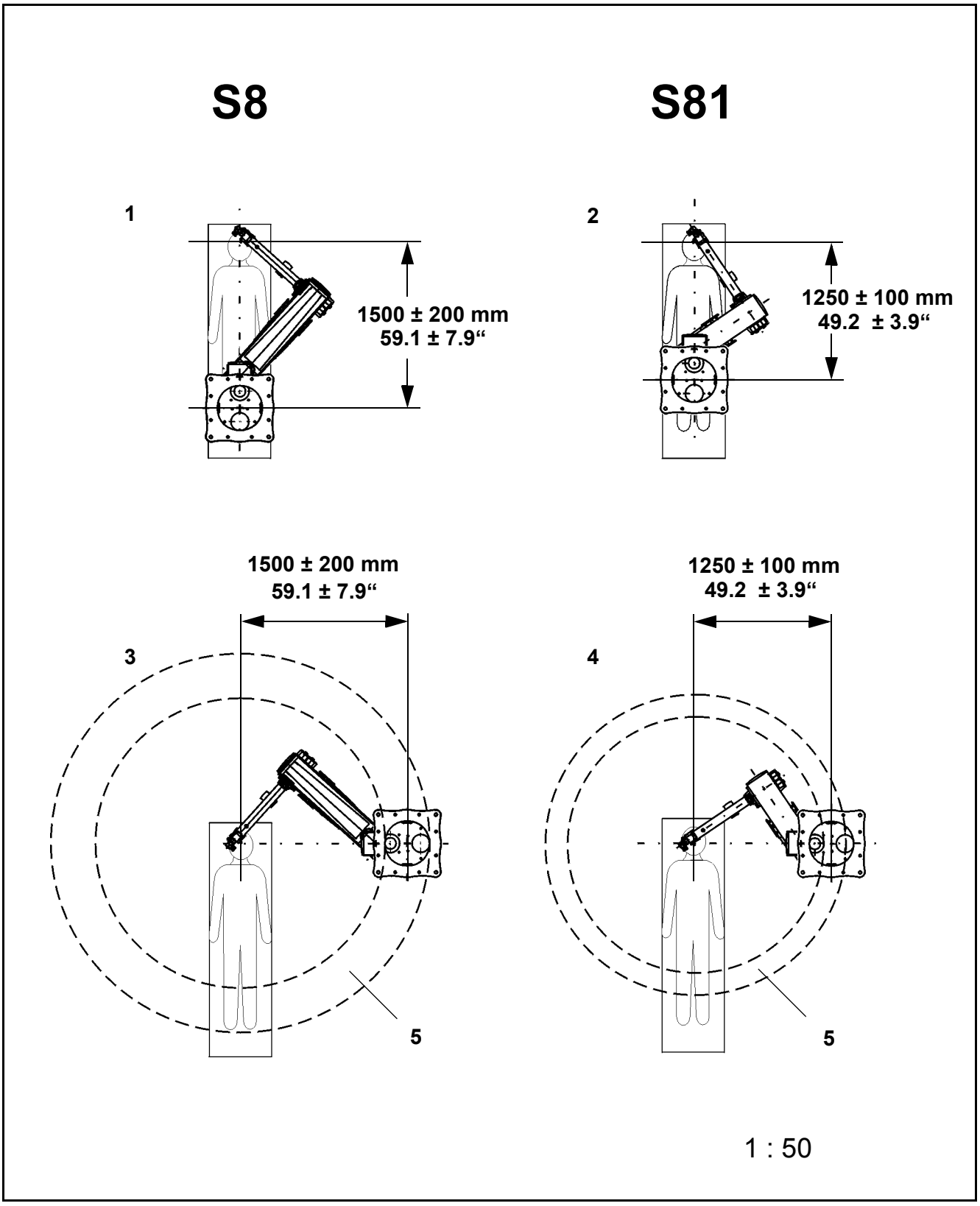
1 S8 installation above the operating table

2 S81 installation above the operating table

3 S8 installation laterally to the operating table

4 S81 installation laterally to the operating table

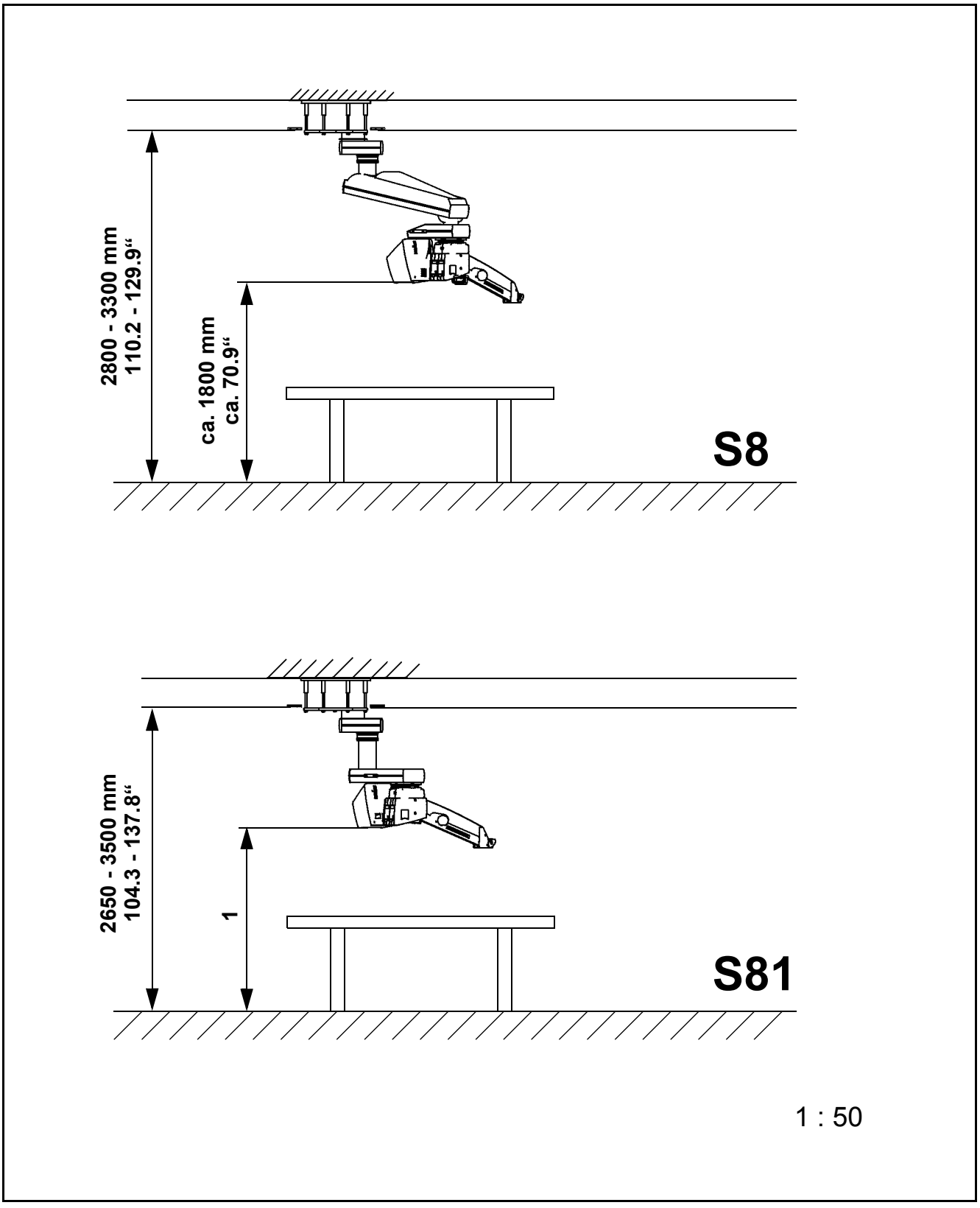
5 Area of possible installation positions for the ceiling anchor plate


S8
S81
1
1500 ± 200 mm
59.1 ± 7.9“
2
1250 ± 100 mm
49.2 ± 3.9“
1500 ± 200 mm
59.1 ± 7.9“
3
5
1250 ± 100 mm
49.2 ± 3.9“
4
5
1 : 50

Distance from floor

1 Distance from floor
We recommend different distances from the floor, depending on the discipline involved.

- ENT 1,650 mm (65")
- ophthalmology 1,800 mm (70.9")
- reconstructive and plastic surgery 1,800 mm (70.9")
- others 1,650 mm (65")


2800 - 3300 mm
110.2 - 129.9“
ca. 1800 mm
ca. 70.9“
S8
2650 - 3500 mm
104.3 - 137.8“
1
S81
1 : 50

Operating position

The ceiling mounts are shown in a typical operating position. The angle between the microscope arm and the carrier arm is 90°. At this angle, minimum effort is required for horizontal movement of the surgical microscope.

Side view

1 S8 normal installation

2 S81 normal installation

If, due to other installations, the space available on the ceiling is not sufficient for normal installation, you can use installation method 3 or 4 as an alternative.

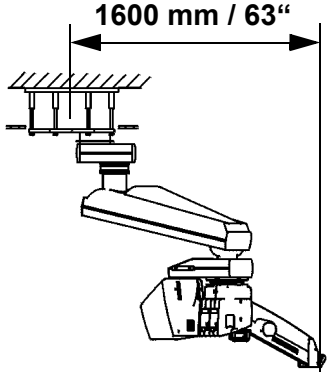
3 S8 installation in cramped conditions
The mount flange is installed in a position rotated through 180°. Also see page 18. OR illuminators cannot be mounted in this case. The same installation principle can also be used for the S81 ceiling mount (not shown here).

4 S8 installation in cramped conditions
The brake arm is installed in a position rotated through 180°. Also see page 18. OR illuminators cannot be mounted in this case. The same installation principle can also be used for the S81 ceiling mount (not shown here).

S8

1600 mm / 63“

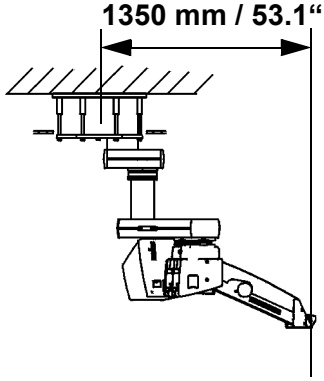
1



S81

1350 mm / 53.1“

2

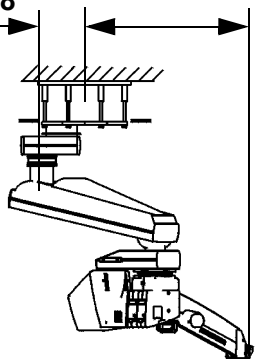


S8

1100 mm / 43.3“ (S8)
850 mm / 33.5“ (S81)

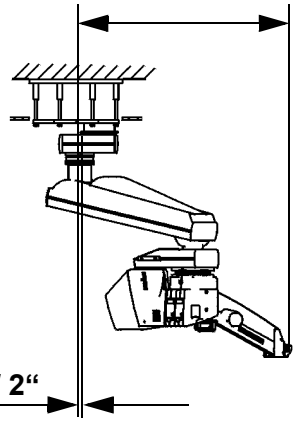
250 mm / 9.8“

3



1400 mm / 55.1“ (S8)
1150 mm / 45.3“ (S81)

4



50 mm / 2“

1 : 50

Top view

1 S8 normal installation

2 S81 normal installation

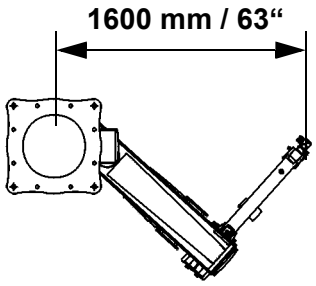
If, due to other installations, the space available on the ceiling is not sufficient for normal installation, you can use installation method 3 or 4 as an alternative.

3 S8 installation in cramped conditions
The mount flange is installed in a position rotated through 180°. Also see page 16. OR illuminators cannot be mounted in this case. The same installation principle can also be used for the S81 ceiling mount (not shown here).

4 S8 installation in cramped conditions
The brake arm is installed in a position rotated through 180°. Also see page 16. OR illuminators cannot be mounted in this case. The same installation principle can also be used for the S81 ceiling mount (not shown here).

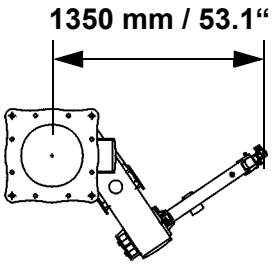
S8

1



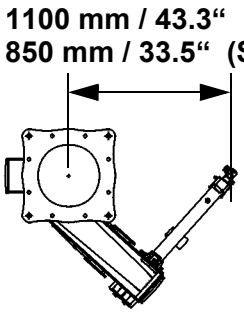
S81

2

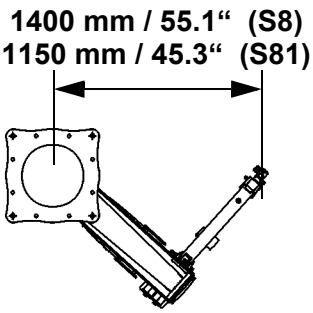


S8

3



4



1 : 50

Operating range of the ceiling mount

S8 ceiling mount

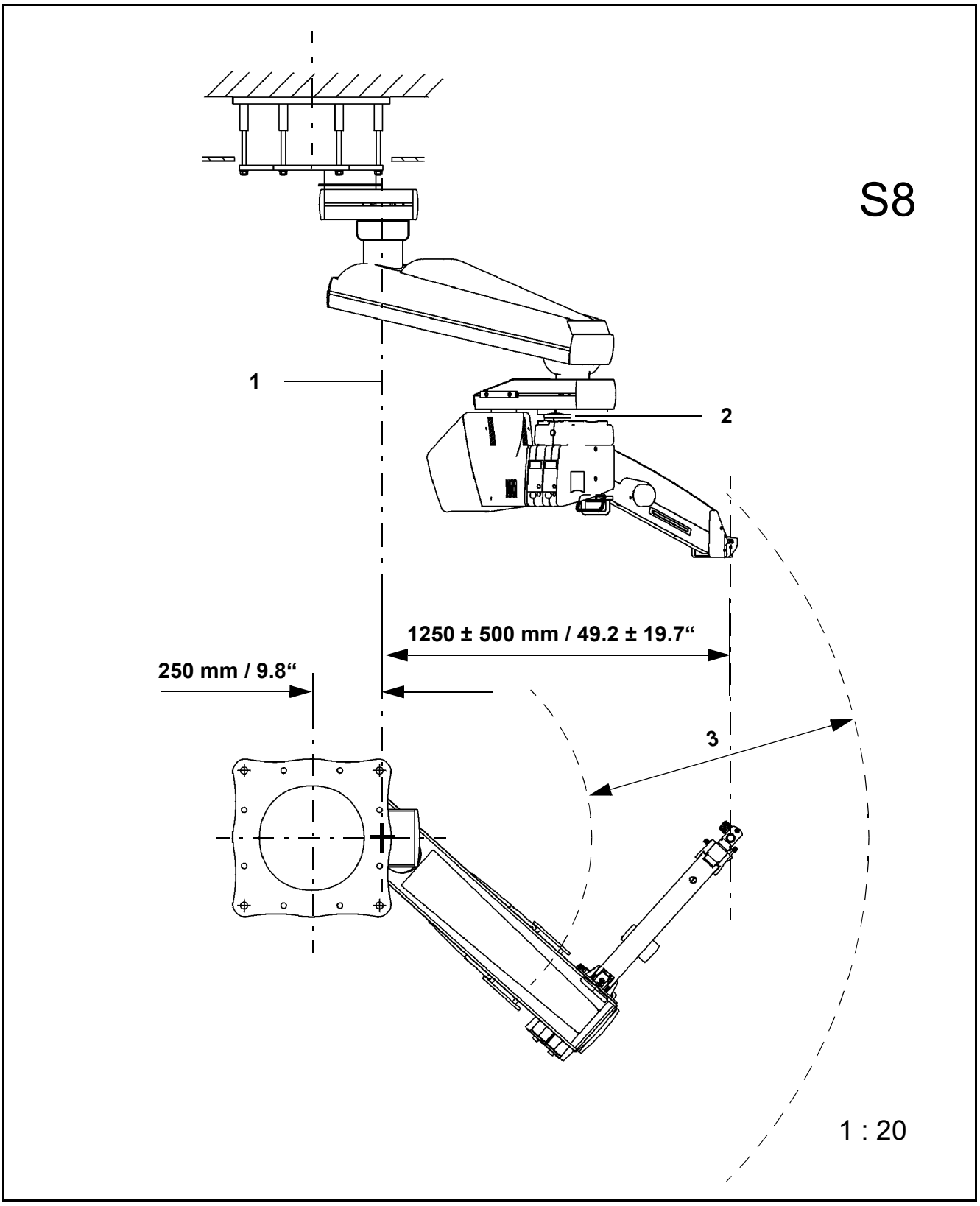
The operating range specified here applies to normal installation.

For installation in cramped conditions, the dimensions shown on page 16 and page 18 can be used to determine the operating range of the ceiling mount.

1 Pivot axis 1

2 Pivot axis 2

3 Operating range for the surgical microscope


S8
1
2
1250 ± 500 mm / 49.2 ± 19.7“
250 mm / 9.8“
3
1 : 20

S81 ceiling mount

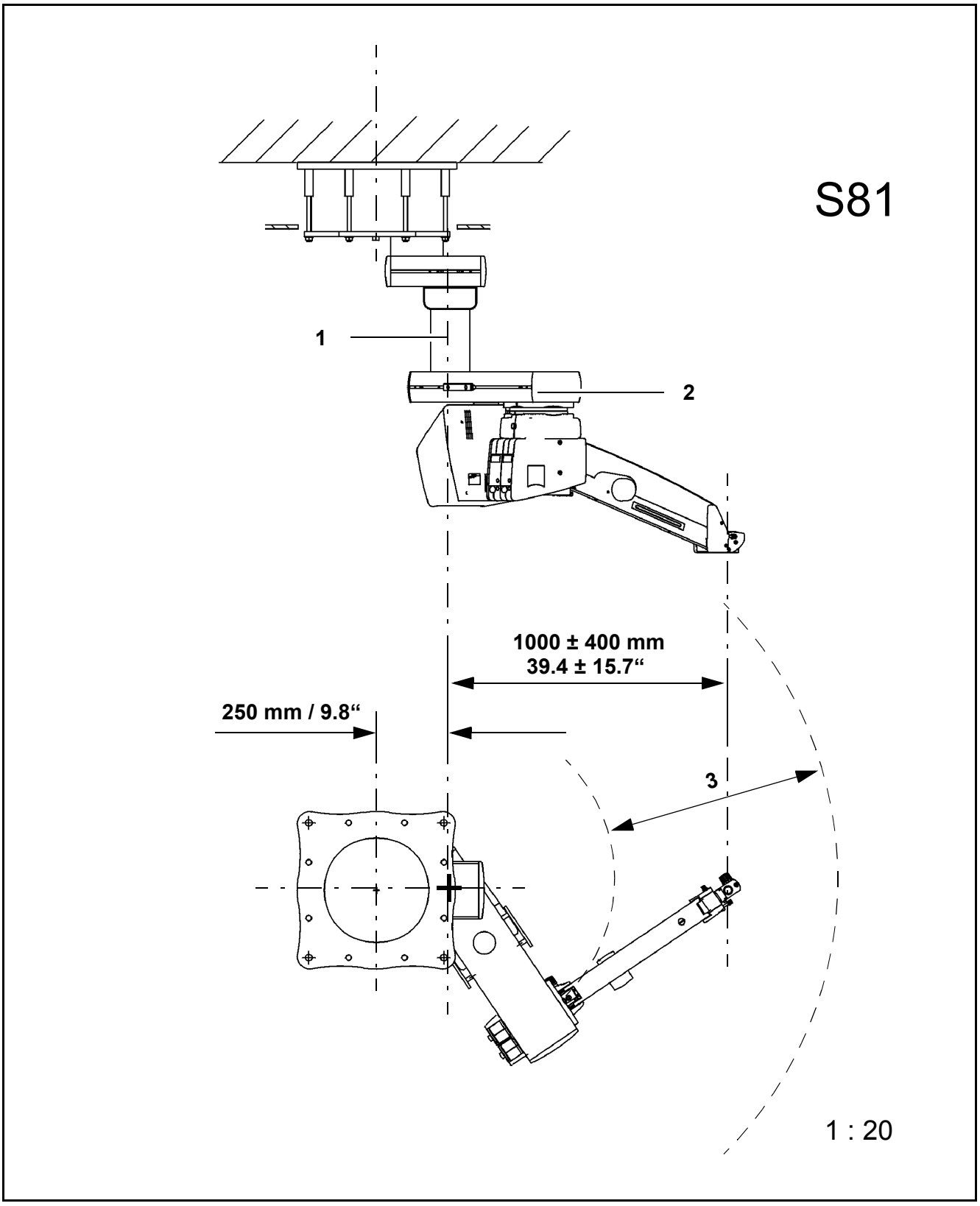
The operating range specified here applies to normal installation.

For installation in cramped conditions, the dimensions shown on page 16 and page 18 can be used to determine the operating range of the ceiling mount.

1 Pivot axis 1

2 Pivot axis 2

3 Operating range for the surgical microscope


S81
1
2
1000 ± 400 mm
39.4 ± 15.7“
250 mm / 9.8“
3
1 : 20

On-site preparations

Customer's responsibilities

Note:
Zeiss service staff can install the ceiling mount only if all points of the following checklist applicable to the relevant installation conditions have been fulfilled.

The actual load on the ceiling depends on a large number of different factors, which must be determined in detail by a structural engineer on a case-to-case basis: see "Constructional requirements for ceiling mounts" on page 29.

Caution:

- Make sure that a structural engineer checks the installation conditions during the planning procedure.
  Structural verification must be performed prior to the installation of the mount.
  We recommend filing the structural verification in the ceiling mount documentation.
- Obtain a written confirmation from a structural engineer stating that the applicable national codes and regulations have been complied with.
- Please add a copy of the "Confirmation of structural calculation" to your order (see page 47).
- If any differences exist between the planning documents and the actual on-site situation, please inform your contact at Carl Zeiss or the planning expert prior to the installation of the pre-installation set.
- The system should be installed on a hard, level surface, e.g. concrete. Do not countersink the pre-installation set, but mount it directly on the respective surface.
- On-site conditions also include building vibrations, which the structural engineer responsible must take into account right during the planning phase (see page 26).
  Obtain a written confirmation from your structural engineer stating that possible building vibrations have been taken into account (see page 47).

Warning!

- If an existing ceiling anchor plate or intermediate piece must be exchanged, never re-use the old anchors. New anchor holes must be drilled.
  When calculating the effective strength of the new anchors, the structural engineer must take into account the weakening effect of the old holes in the ceiling.

Planning the installation

- Inspect the mounting components supplied for completeness and damage.
- Prior to the installation of a ceiling mount, you must always check that the actual installation conditions - in particular the room height - correspond to the specifications in the drawing.
- Make sure that the anchors calculated by your structural engineer are properly installed, that the nuts and washers required to mount the ceiling anchor plate are readily available at the installation site and that the maximum tightening torque for the nuts is indicated.
- For new installation, the pre-installation set must be mounted before the false ceiling is attached.
- At least 2 installers are required for mounting the pre-installation set.
- Installation of a ceiling mount in rooms with an air supply ceiling requires proper preparation of the air supply ceiling (see page 30).

Building vibrations

The on-site requirements also include the low-vibration design of the ceiling in the OR. This must be taken into account right during the planning phase for the ceiling mount.
The following information primarily refers to the ceiling mount, but it can also be applied to a wall mount or floor stand.

Two types of excitation factors must be distinguished:

Single events which excite short-term vibration

Induced by inadvertent knocks against the suspension system or strong impact against ceiling, wall or floor. This is the most frequent, but least critical type of excitation. The ZEISS ceiling mount features excellent damping against this type of vibration and displays a short recovery time. In extreme cases, surgery has to be interrupted for a few moments.

Constant excitation causing sustained vibration

The excitation energy of factors such as elevators, air conditioning systems, construction work, traffic does not easily reach the ceiling mount via the building. This type of excitation is extremely rare, but may lead to permanent vibration of the ceiling mount in extreme cases. This becomes particularly visible at high magnifications as used in the surgical microscope.
The following result of a study is intended to help you understand constant vibration excitation occurring in rare cases in ceiling mounts, eliminate it or prevent it from the outset in new installations.

Like any kinematic system, the Zeiss ceiling mount displays eigenfrequencies (=resonance frequencies) that range between 2 and 80 Hz depending on the position of the system and the accessories attached to it.
The ZEISS ceiling mount provides very effective damping in particular against higher frequencies above 10 Hz which are typical of buildings with electrical excitation factors. Nevertheless it may happen in rare cases, when the ceiling mount's suspension arm is in a specific position, that even high frequencies which are critical for this particular constellation lead to vibrations (e.g.: 17 Hz, ..., 19 Hz, ...).

Such excitation factors can usually be suppressed by the following measures:

– elimination of the excitation source (e.g. repair or damping of the air conditioning system)

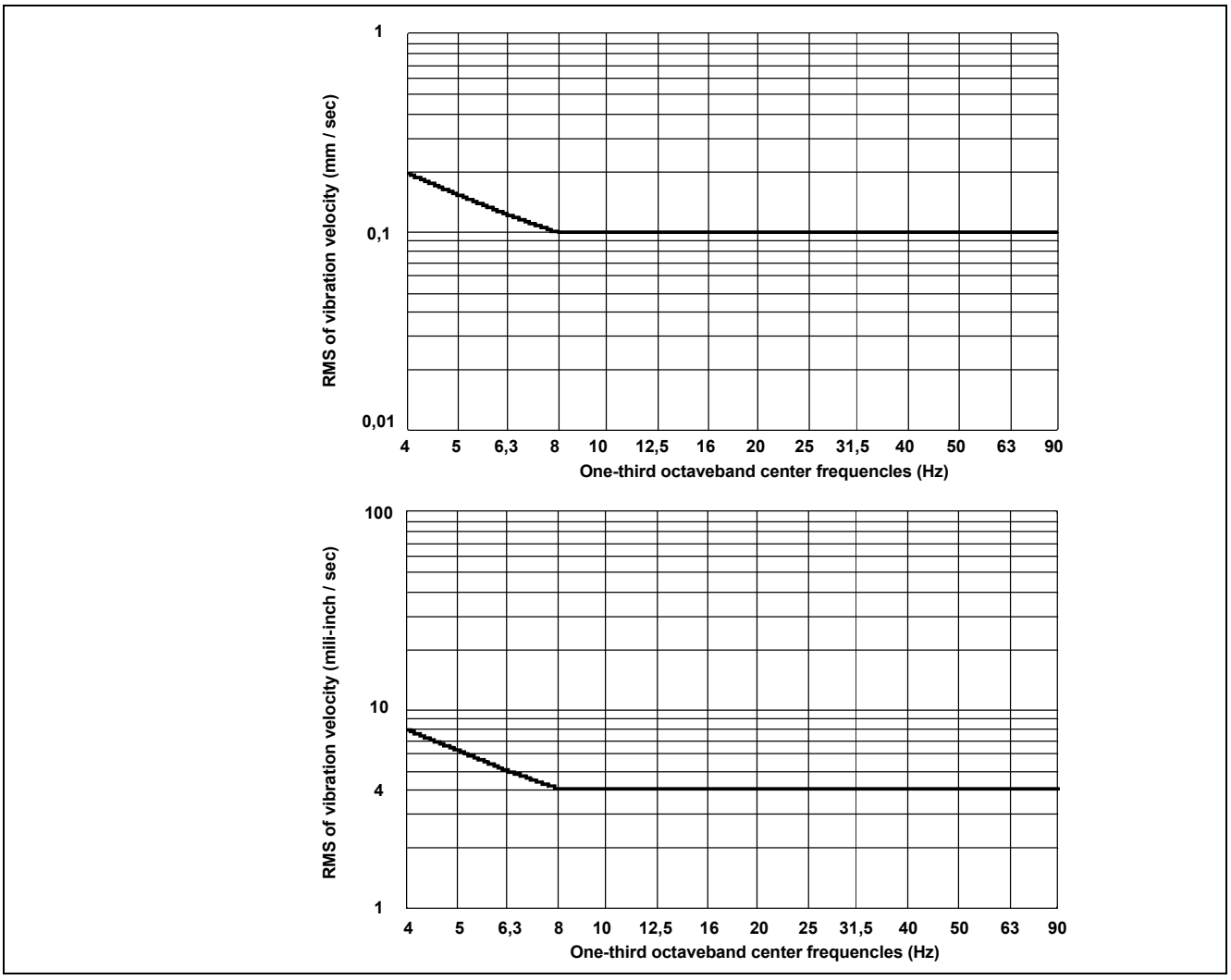
– constructional damping measures in the ceiling installation

Due to the large number of parameters involved and the variety of potential building/ceiling mount constellations, Carl Zeiss Surgical is unable to give an absolute guarantee for the vibration-free suspension of the ceiling mount, even if the building meets the applicable ISO standards.
However, it is highly improbable that constant vibrations are transferred to the ceiling mount if all requirements regarding vibrations in the OR ceiling are met.

– Max. vibration velocity (RMS) at the installation points for the ceiling mount.

– V_{max} < 0.1 mm / s or V_{max} < 4 milli-inches / s or below the curves (diagram) for the specified frequency range.

Sources: Carl Zeiss Surgical (in-house study), ISO 10811, recommendations for ORs.



Customer's preparatory responsibilities, overview

- Mounting of the pre-installation set.
- Installation and connection of the systems's power cables on the pre-installation set.
- The power line of the ceiling mount must be protected by a 1-pole automatic circuit breaker (230 V: 10 A, 115 V: 20 A) or a 1-pole slo-blo fuse (230 V: 10 A, 115 V: 20 A). The fusing must be installed in the phase wire.
- A 2-pole power switch with an admissible contact load of min. 230 V: 10 A (115 V: 20 A) must then be installed. Alternatively, a power switch can be integrated in the system as part of the instrument connector option. Also see page 48 and page 52.
- Installation of the wall socket (flush or surface socket).
- Installation of conduits and cables for
  - power line, 3 x 1.5 mm^2 (3 x AWG16)
  - wall socket for foot control panel (as required)
  - potential equalization (as required)
  - video, internal diameter 50 mm (2") (as required)
  - OR illuminators (24 V DC with backup power supply, customer's responsibility) (as required)
  - other OPMI accessories such as BIOM/SDI, additional illumination, AUX output port, etc. (as required)
  - We recommend installing further conduits, e.g. to the central OR control panel, for future upgrades.
  - The maximum admissible cable length for SpeedFokus is 10 m (394"). If this is not sufficient, a signal amplifier must be provided.

Constructional requirements

The actual load on the ceiling depends on a large number of different factors. The requirements to be met by the ceiling or substructure result from the addition of perpendicular forces and torques produced by the suspension system and accessories. These are the forces to be transmitted into the structural ceiling via the ceiling anchors.
The column must be aligned in a vertical position (max. deviation ± 0.5°).

Forces and torques

Warning!
The structural engineer must ensure in each individual case that the structural ceiling has a sufficient load capacity for the forces and torques listed below. He must also take into account any additional loads on the ceiling and add an appropriate safety margin, and must observe the applicable national codes and regulations.

Caution:
– The perpendicular forces and torques specified below include an additional load of 100 kg (220 lb), which is generated when a person hangs on the end of the suspension arm (or the microscope). Further safety margins have **not** been incorporated.

– The perpendicular forces and torques have been calculated on the basis of the maximum permissible load on the suspension arm.

S8 or S81 ceiling mount
For an S8 or S81 ceiling mount alone (without accessories on the accessory interface), the structural ceiling must have the following load capacity:

– Perpendicular force: minimum 2500 N (565 lbf)
– Torque: minimum 3000 Nm (2215 lbf.ft)

Mounting a pre-installation set on ceilings with air-supply ceiling

Caution:
If the carrier arm systems are installed in air-supply ceilings, the method of installation must be specifically adapted to the constructional features of the type of air-supply ceiling involved.

A false ceiling set is mounted to bridge the distance between the structural ceiling and the non-structural false ceiling. The length of the stud bolts and spacers used is adapted on site as required.
The necessary planning should be performed in consultation with the manufacturer of the air-supply ceiling and Carl Zeiss.

When ordering, please specify distance (A), i.e. the distance between the lower surface of the structural ceiling and the lower surface of the false ceiling.

Note:
- Distance (A) is the height of the false ceiling and must not exceed 800 mm. Otherwise, a ceiling substructure must be installed to bridge the excess distance. Distance (Z) is the height of the air-supply ceiling.
- It is essential that the false ceiling set (2,3) and the conduits for the power lines be installed before the air-supply ceiling is attached. Subsequent installation is not possible, for reasons of space.
- A manhole (5) which is free from compressed air must be available for the installation work. The internal diameter (S) of the manhole must be larger than that of the opening in the ceiling (M).
- The opening of the manhole to the OR can be closed with a separate cover (7) by the manufacturer of the air-supply ceiling.

1 Structural ceiling

2 Ceiling anchor plate

3 Spacers

4 Upper surface of air-supply ceiling

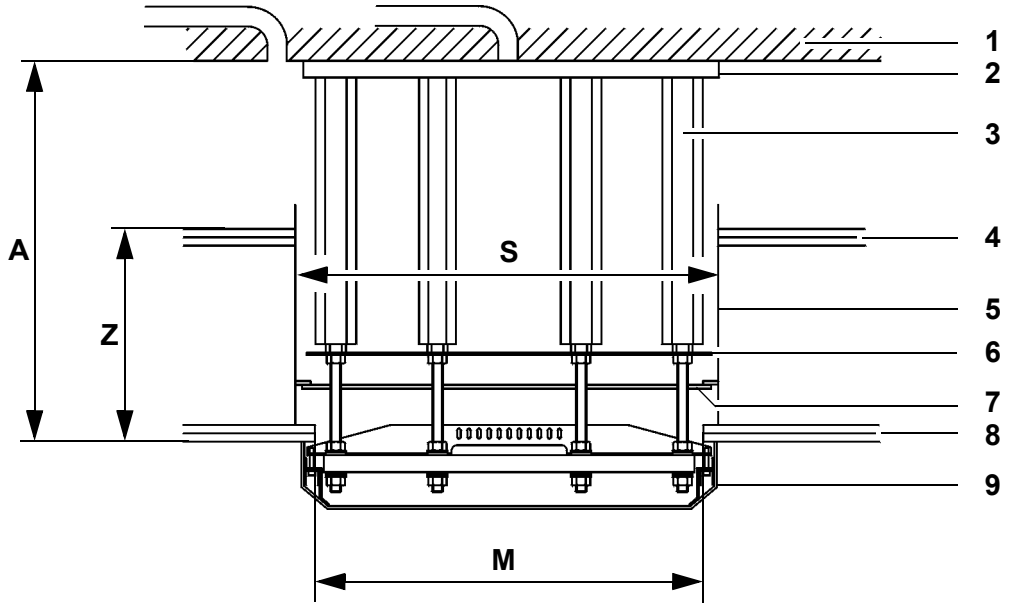
5 Manhole

6 Interface plate

7 Cover of carrier arm system to OR (customer's responsibility)

8 Lower surface of air-supply ceiling

9 Ceiling panel


A
Z
S
M
1
2
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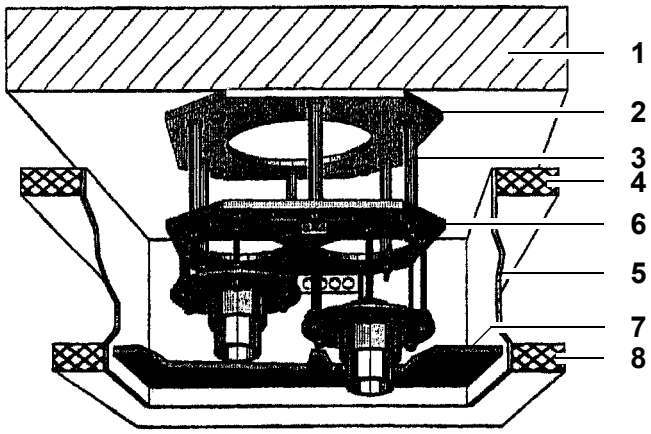
5
6
7
8
9


1
2
3
4
6
5
7
8

Planning the electrical installation

The power lines on the site of installation must be run up to the interface plate. In addition, the potential equalization lines must be run to the terminals on the interface plate.

Warning!

– The planning, execution and inspection of the on-site electrical installations must be performed by expert electrical technicians and officially registered electrical firms.

– The electrical installations of the room concerned must comply with the requirements of the applicable national regulations. In the Federal Republic of Germany, VDE 0107 applies.

– The number of circuits is dependent on the customer's specific carrier system configuration.

– If several circuits are required by the customer, appropriate allowance must be made on the interface plate.

– Multiwire lines must be provided with wire end sleeves.

Installing the conduits

The wiring can be run either above the false ceiling or in conduits installed in the structural ceiling. There are two options for the installation of conduits in the structural ceiling.

– The exit of the conduits is positioned beside ceiling anchor plate (8).

– The exit of the conduits is positioned at the center of ceiling anchor plate (8).

The conduits have an internal diameter of 22 to 50 mm (0.9 - 2").

A conduit with a minimum internal diameter of 35 mm (1.4") is required for the MediLive video line.

Key

1 Power line
3 x 1.5 mm^2

2 Wall socket for foot control panel
As required.

3 Potential equalization
As required.

4 TV internal diameter 50 mm (2")
As required.

5 OR illuminators
24 V DC with backup power supply, customer's responsibility (as required)

6 Other OPMI accessories
e. g. BIOM/SDI, additional illumination, AUX output port, etc. (as required)

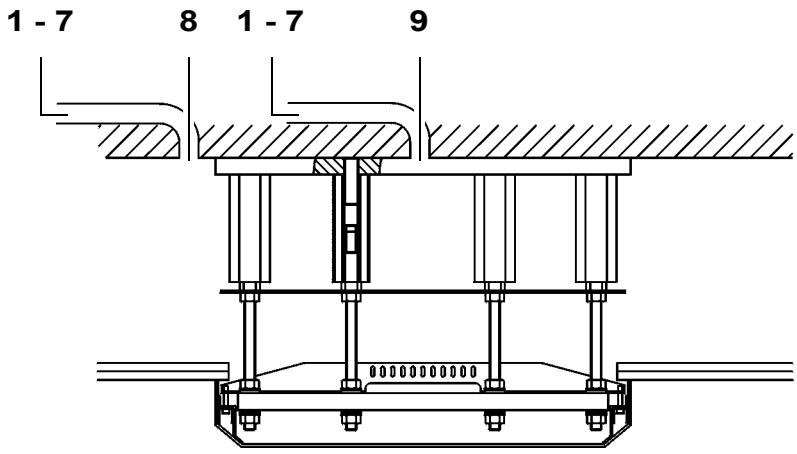
7 Further conduits
We recommend installing further conduits for future upgrades.

Connection of SpeedFokus AF

Note:

- Determine the exact length between the Speedfokus AF connection and the CCU+ monitor.

If the cable length exceeds 10 m (394"), a signal amplifier is required for the SpeedFokus AF. The signal amplifier requires 110 - 230 V line power.



Mounting the wall socket

Note:

– We recommend mounting wall socket (3) on the wall located behind the surgeon. Height approx. 1.4 m (55.1").

– Please also note the chapter "Installing the conduits" on page 34.

Kit 1078-524 contains the following components for mounting the wall socket:

– Wall socket for flush mounting

– Wall socket for surface mounting

– 10 m (394") cable

– Hanger for foot control panel

• Use the wall socket which is more suitable for your purposes.

Key

1 Wall socket for surface mounting

2 Wall socket for flush mounting

3 Wall socket

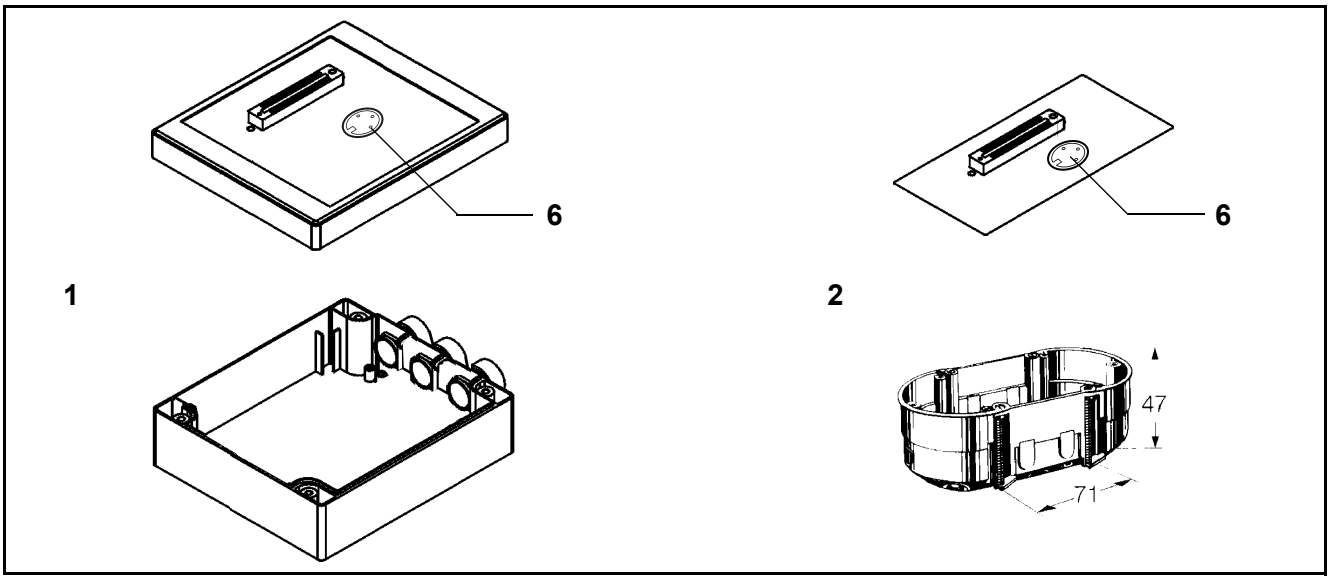
4 Central OR control panel (part of customer's installations)

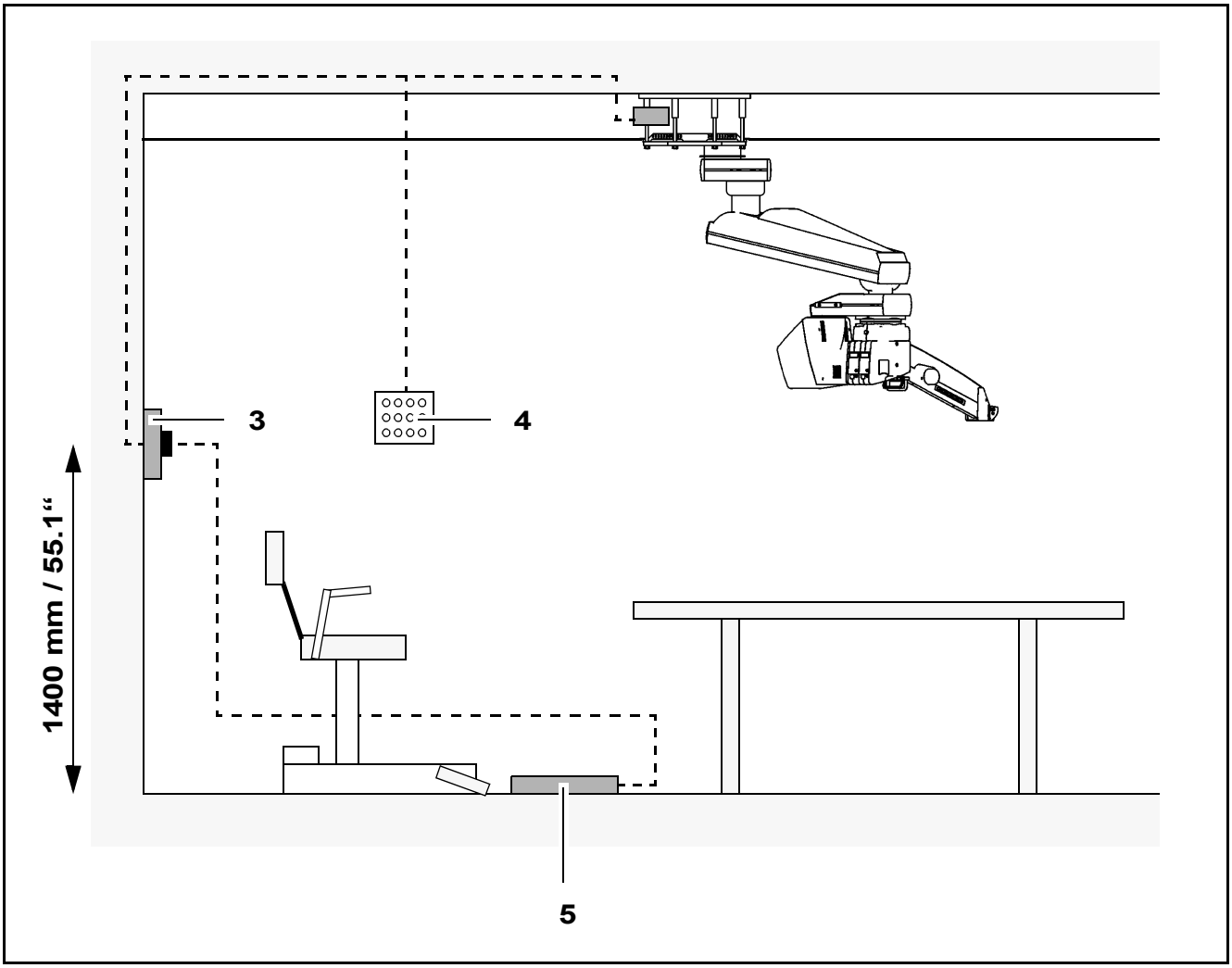
5 Foot control panel

6 Remote control socket for an external signal of a maximum of 24 V / 0.5 A.

Remote control socket (6)

View on connector side


6
1
6
2
47
71


3
4
1400 mm / 55.1“
5

On-site electrical installation

The power lines on the site of installation must be run up to the interface plate. In addition, the potential equalization lines must be run to the terminals on the interface plate.

Warning!

– The planning, execution and inspection of the on-site electrical installations must be performed by expert electrical technicians and officially registered electrical firms.

– The electrical installations of the room concerned must comply with the requirements of the applicable national regulations. In the Federal Republic of Germany, VDE 0107 applies.

– The number of circuits is dependent on the customer's specific carrier system configuration.

– If several circuits are required by the customer, appropriate allowance must be made on the interface plate.

– Multiwire lines must be provided with wire end sleeves.

Key

A Connectors for accessory modules (OR illuminators, monitor bracket)

For details of terminals B and C, see the section "Accessory interface", page 71.

D Connectors for potential equalization
Maximum terminal cross sections
Terminals 1 - 4 = 16 mm^2 (AWG 6)
Terminals 5 - 8 = 6 mm^2 (AWG 10)

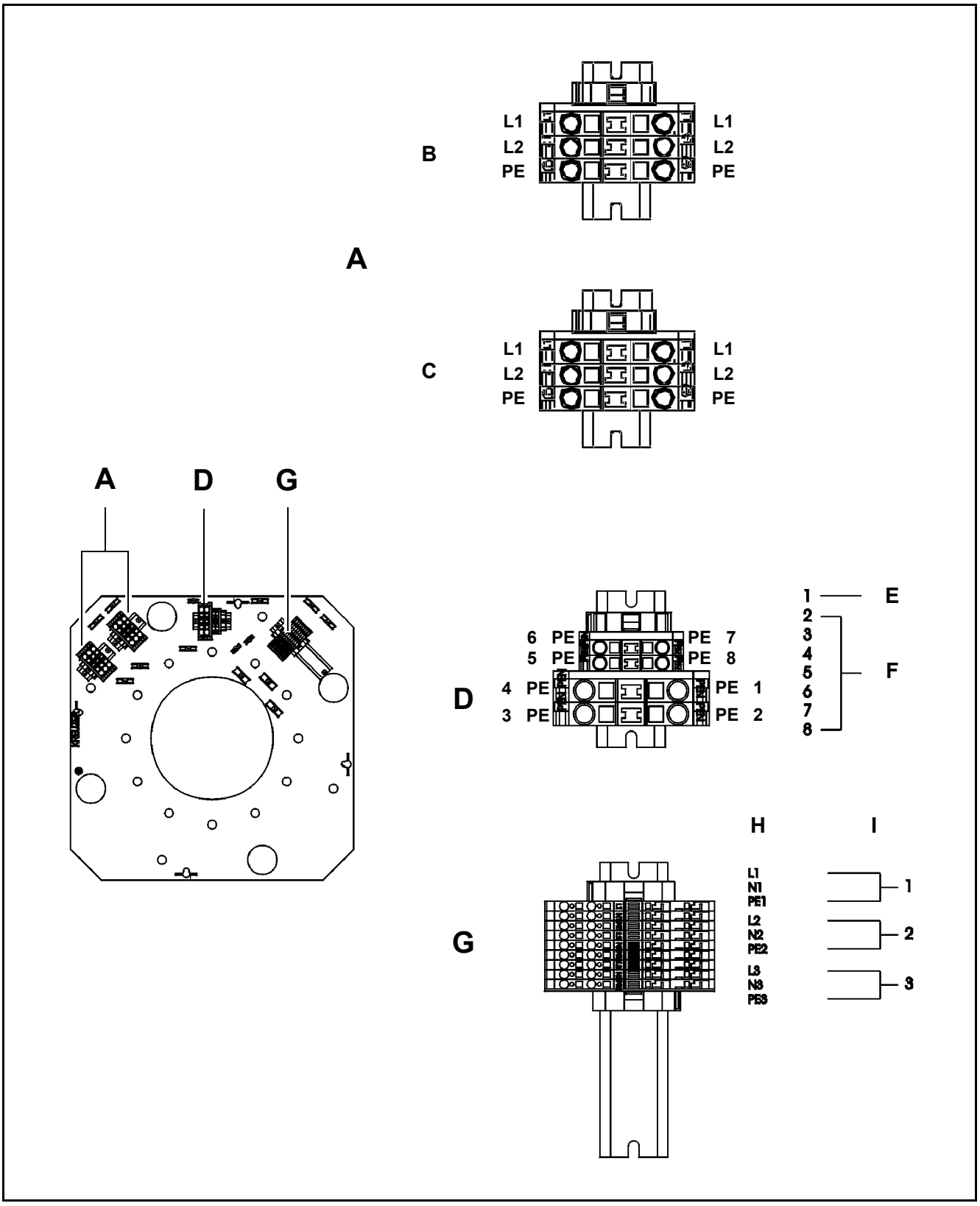
E On-site connector

F Ceiling mount connectors

G High-current connectors
Maximum terminal cross section = 4 mm2 (AWG 12)
Connector (part no. 6 001 215) with the contacts (H): L1, N1, PE1; L2, N2, PE2 and L3, N3, PE3.

H Terminal numbers

I Circuit numbers


A
B
L1
L2
PE
L1
L2
PE
C
L1
L2
PE
L1
L2
PE
A
D
G
D
6 PE
5 PE
4 PE
3 PE
PE 7
PE 8
PE 1
PE 2
1
2
3
4
5
6
7
8
E
F
G
H
I
L1
N1
PE1
L2
N2
PE2
L3
N3
PE3
1
2
3

Checking the power connection

Caution:
The ceiling mount can be set at two points to the rated voltage used in the country of destination:

– Transformer terminal on interface plate.
  Settings: 100 - 115 - 230 V

– Power supply unit
  Settings: 115 - 230 V

The correctness of the factory-adjusted setting is checked by our service team during first-time installation.

– The power connection must conform to the regulations applicable in the country of destination.

– A power switch (2-pin) has been provided.

– Line fuse
  230 V: min. 10 A, slo-blo, class C
  115 V: min. 20 A, slo-blo, class C

– All cables and plugs must be in perfect condition.

– Potential equalization: if required, the instrument can be incorporated into protective "potential equalization" measures.

– A connector for OR illuminators is provided (option).

We recommend integrating the power switch in the central OR control panel.

Planning the mechanical installation

Mounting the pre-installation set

Note:

- Check the installation conditions, in particular with respect to the room height.
- Mount the pre-installation set, before the false ceiling is attached.

Two installers are required for mounting the pre-installation set. The ceiling anchor plate alone weighs approx. 40 kg.

The pre-installation set comprises the following modules:

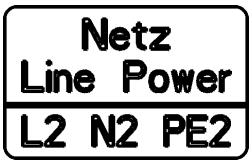
1 Ceiling anchor plate

2 Spacers (8 units)

3 Interface plate

4 Line power connection label (1167-817).

Line power connection label (4)
Line power connection label (1167-817) identifies the line power terminals. The installer attaches the label when mounting the pre-installation set.



Auxiliaries required:

– Two sufficiently long ladders and a lifting device (lift table).

– Torque wrench: 0-120 Nm (minimum).

– Open-end wrenches and drive sockets for torque wrench:
24 mm and 55 mm (0.9" und 2.2").

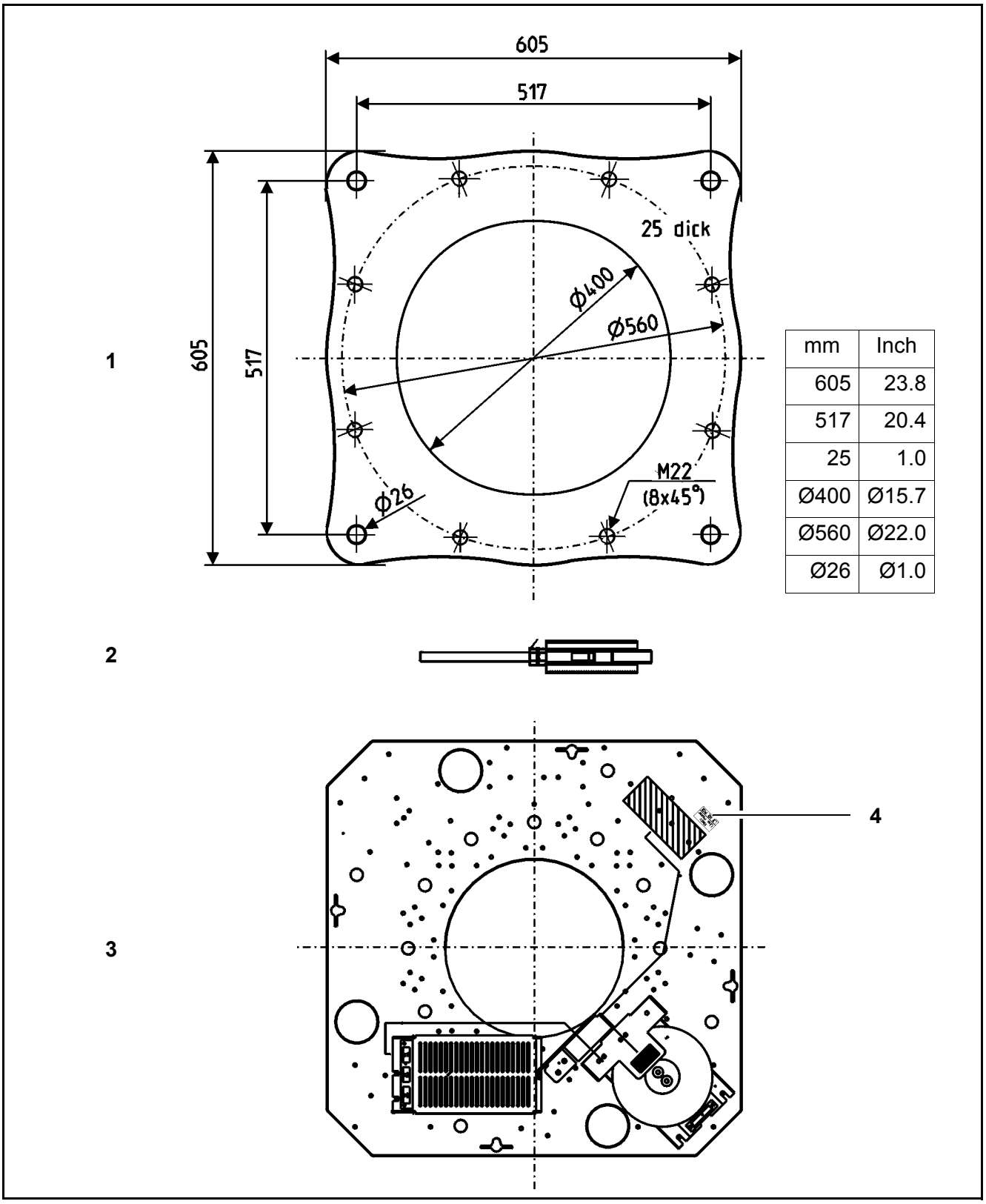
– Anchors as specified by the structural engineer.

– Sheet specifying dimensions (supplied with the pre-installation set).

Mounting the ceiling anchor plate

The ceiling anchor plate weighs approx. 40 kg. Two installers are required for mounting it.

- Measure the position in accordance with the plan and make sure that one side of the ceiling anchor plate is parallel to the nearest wall.

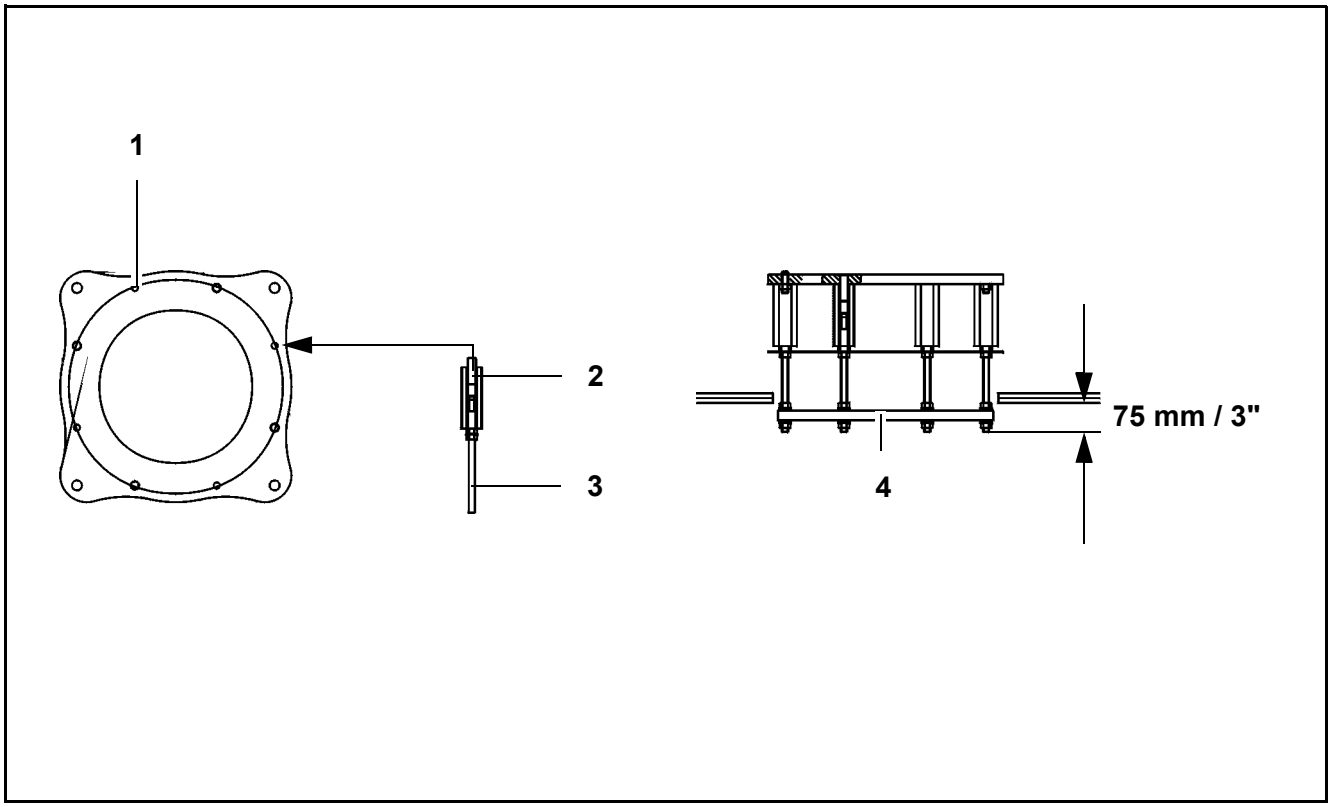


mm	Inch
605	23.8
517	20.4
25	1.0
Ø400	Ø15.7
Ø560	Ø22.0
Ø26	Ø1.0

Mounting the spacers

- Mount eight spacers (2) in the ceiling anchor plate (1).
- Firmly tighten the spacers (2) using a torque wrench with a 55 mm (2.2") fork wrench bit. Apply a torque of 120 Nm.
- Adjust the length of the stud bolts (3) in such a way that the distance between the lower surface of the false ceiling and the lower edge of the stud bolt is 75 mm (3").

Note:
The mount flange (4) is only shown here for information. It is not included in the pre-installation set. The mount flange (4) is part of the ceiling mount.

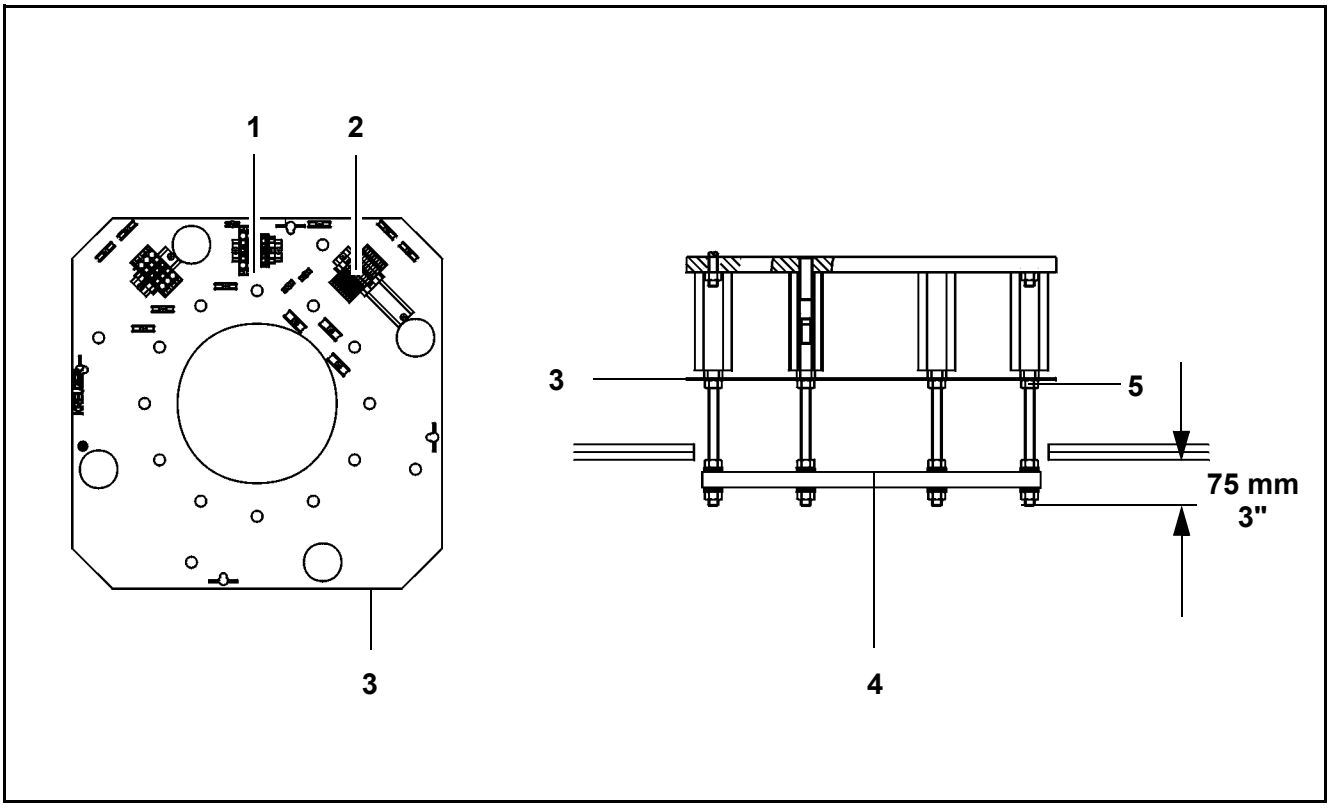


Mounting the interface plate

Note:
The connector for potential equalization (1) and the terminals for power line (2) are provided on interface plate (3).

- Check whether interface plate (3) corresponds to the drawing supplied with the pre-installation set (reference no.).
- Remove nuts M16 (SW 24) (5) from all stud bolts.
- Slide interface plate (3) on the stud bolts in such a way that one side is parallel to the nearest wall. The terminals for power line (2) must point downward. Screw nuts M16 (SW 24) (5) onto the stud bolts.
- Tighten nuts M16 (SW 24) (5) with a torque of 70 Nm (51.6 lbf.ft).

Note:
The mount flange (4) is only shown here for information. It is not included in the pre-installation set. The mount flange (4) is part of the ceiling mount.



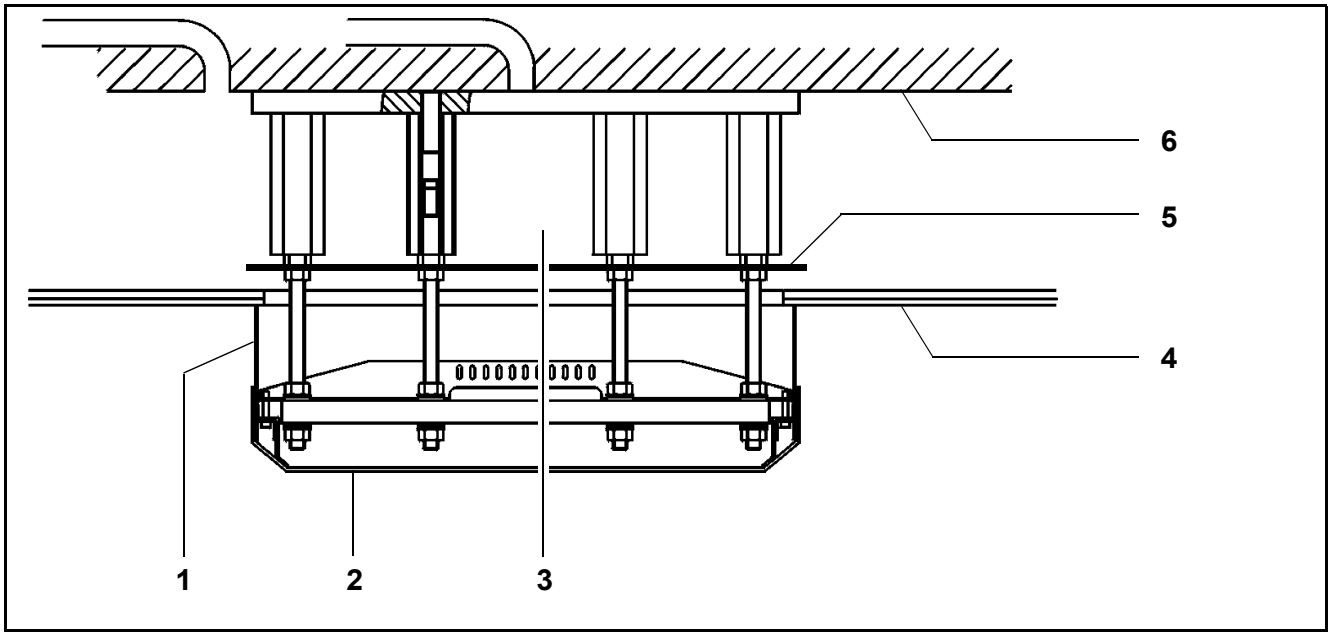
300 mm (11.8") ceiling panel extension

Ceiling panel extension (1) is required if the distance between the structural ceiling and the false ceiling (i.e. dimension "A" in the order forms) is clearly shorter than 200 mm (7.9"), i.e. < 190 mm (<7.5"). In this case, ceiling panel (2) alone will not suffice to completely cover pre-installation set (3).
Ceiling panel extension (1) cannot enclose interface plate (5). If interface plate (5) also protrudes from the false ceiling, you must order the "Cover for pre-installation set" (Cat. No. 1139-023).

You can order a 300 mm (11.8") ceiling panel extension including mounting instructions (1177-632) as a spare part from the Zeiss Service Department.
The installer will cut the 300 mm (11.8") ceiling panel extension to the length required on site and install it as per the mounting instructions (1177-632).

Key

1 Ceiling panel extension 300 mm (11.8") (1177-632)
2 Ceiling panel for S8 / S81 ceiling mounts (1083-804)
3 Pre-installation set (1078-181)
4 False ceiling
5 Interface plate
6 Structural ceiling



Confirmation of the structural calculation and execution of installation

Sales order no.: .....

Customer address /
Delivery address: .....
.....
.....

By signing below, the following persons confirm that they have performed their work in a proper and orderly way:

The **structural engineer** for

- the selection and layout of the installation site, taking possible building vibrations into account
- the structural calculation, taking into account the applicable national regulations and the planning manual
- the structural checking of an existing substructure
- the structural calculation of a substructure built on site
- the final checking and release of the structural calculations:

Name and address of
the structural engineer: .....
.....
.....

....

Date Signature

The **installer** for
the proper mounting of the pre-installation set or the ceiling or wall flange from Carl Zeiss**:**

Name and address of
the executing company
and installer's name: .....
.....
.....
.....

....

Date Signature

Ordering data

S8 ceiling mount for ORs with false ceilings, ordering data

Note:
Please note that the relevant dimensions have to be entered in the following drawing for each purchase order.

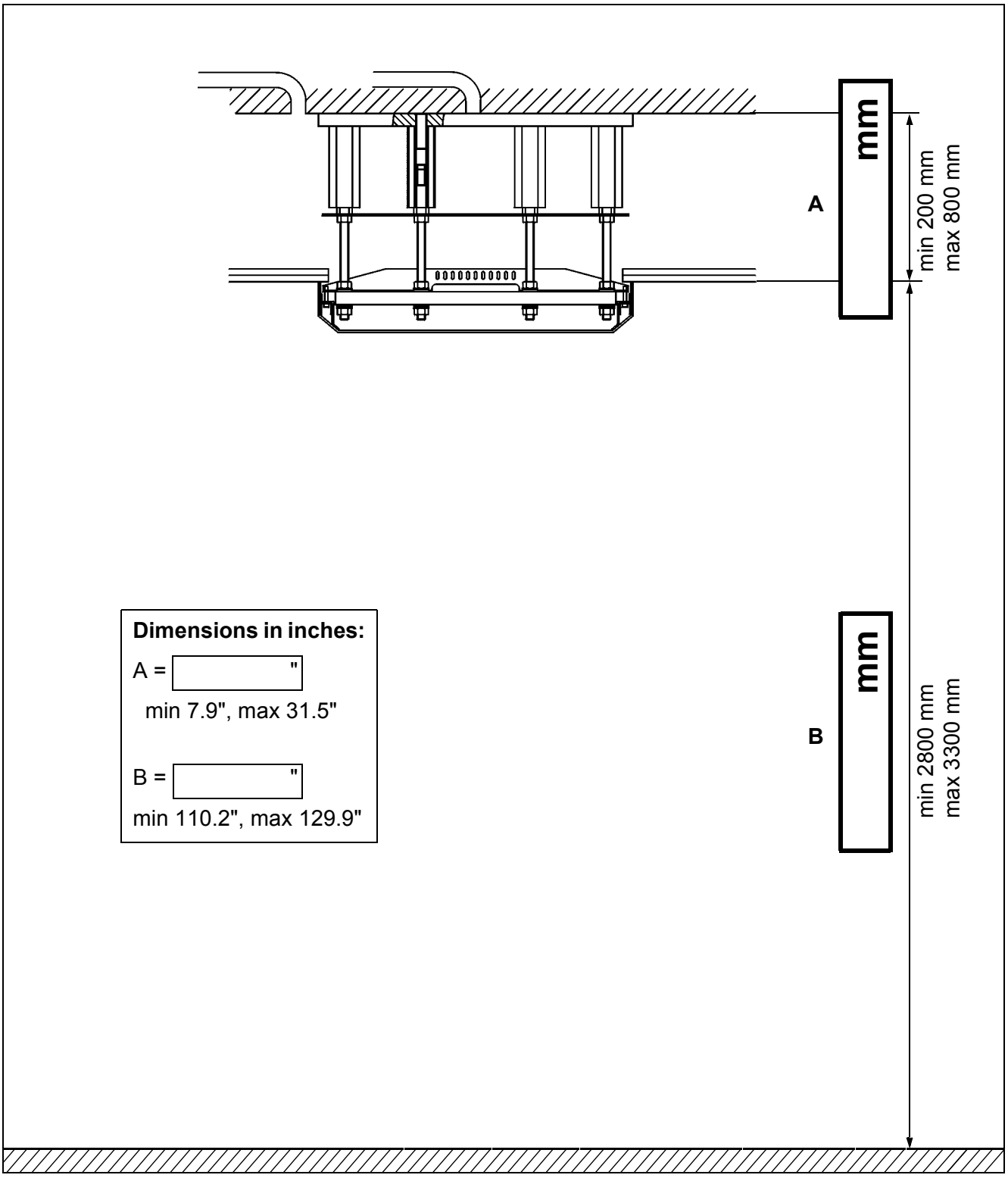
- Enter the data and enclose a copy of the drawing with your purchase order.

Description	Cat.No.
S8 ceiling mount	1176-968
Pre-installation set for new installation	1078-181
Wall socket for S8/S81 CM for foot control panel	1078-524
S8/S81 instrument socket for foot control panel	1141-820
Ceiling panel for S 8 / S81 ceiling mounts	1083-804

A Distance between structural ceiling and false ceiling (ordered length of pre-installation set)

B Distance between false ceiling and floor

Order sheet for S8 ceiling mount in ORs with false ceilings



Dimensions in inches:

A = ____ "

min 7.9", max 31.5"

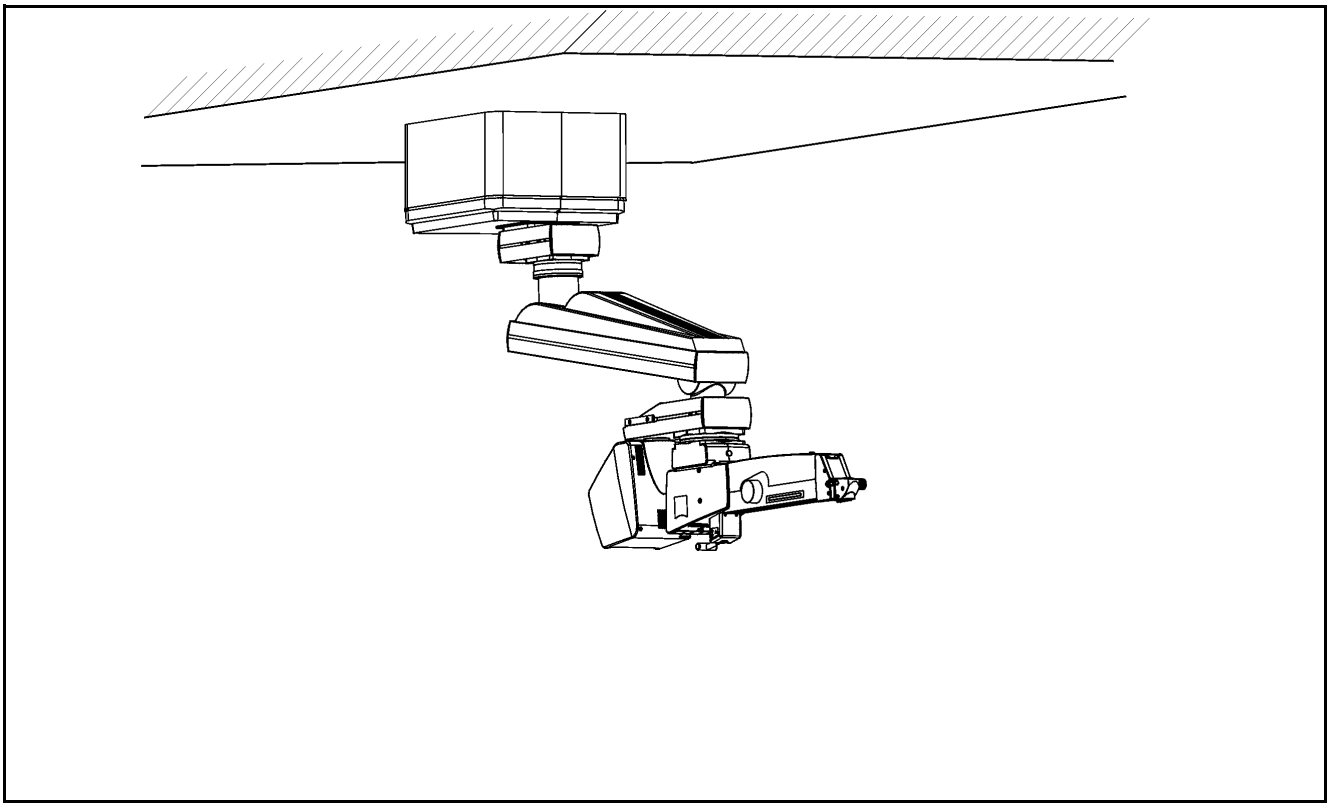
B = ____ "

min 110.2", max 129.9"

S8 ceiling mount for ORs without false ceilings, ordering data

You must order the ceiling mount using the following order sheet only if the OR does not provide a false ceiling.
If the OR does not provide a false ceiling, you will need a cover for the pre-installation set (1078-181). You can order the cover for the pre-installation set as a kit (1139-023).

Description	Cat.No.
S8 ceiling mount	1176-968
Pre-installation set for new installation	1078-181
Cover for pre-installation set	1139-023
Wall socket for S8/S81 CM for foot control panel	1078-524
S8/S81 instrument socket for foot control panel	1141-820
Ceiling panel for S 8 / S81 ceiling mounts	1083-804



Note:
Please note that the relevant dimensions have to be entered in the following drawing for each purchase order.

- Enter the data and enclose a copy of the drawing with your purchase order.

H Room height
Distance from the floor to the structural ceiling.

- You must exactly measure this height.

I Required installation height of the S8 ceiling mount
The installation height of the S8 ceiling mount is the distance from the floor to the bottom surface of the mount flange.

- You must preselect the installation height.

Note:
The installation height can be between 2,800 mm (110.2") and 3,300 mm (129.9"). Ideally, you should select an installation height of 3,100 mm (122") which is the optimum compromise between working height and head room.

A Ordered length of the pre-installation set
can be determined by subtracting the installation height (I) selected and 45 mm (1.8") from the room height (H) measured.

F Length to which cover (1139-023) must be cut
can be determined by subtracting the installation height (I) selected and 52 mm (2") from the room height (H) measured.

1 Structural ceiling, bottom surface

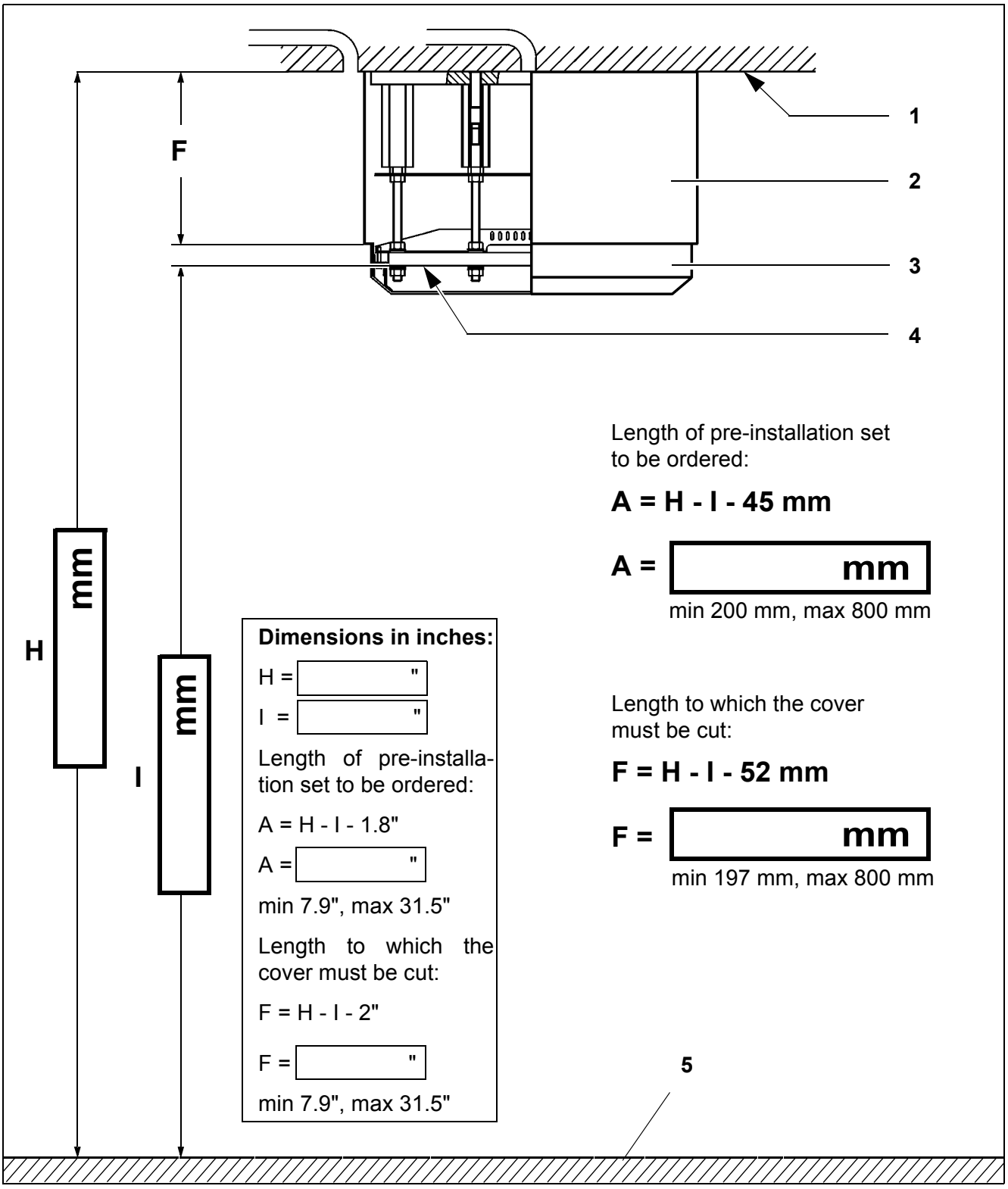
2 Cover of the pre-installation set (1139-023)

3 Ceiling panel (1083-804)

4 Mount flange, bottom surface

5 Floor, top surface

Order sheet for S8 ceiling mount in ORs without false ceilings



Length of pre-installation set to be ordered:

A = H - I - 45 mm

A = ____ **mm**

min 200 mm, max 800 mm

Length to which the cover must be cut:

F = H - I - 52 mm

F = ____ **mm**

min 197 mm, max 800 mm

Dimensions in inches:

H = ____ "

I = ____ "

Length of pre-installation set to be ordered:

A = H - I - 1.8"

A = ____ "

min 7.9", max 31.5"

Length to which the cover must be cut:

F = H - I - 2"

F = ____ "

min 7.9", max 31.5"

S81 ceiling mount for ORs with false ceilings, ordering data

Note:
Please note that the relevant dimensions have to be entered in the following drawing for each purchase order.

- Enter the data and enclose a copy of the drawing with your purchase order.

Description	Cat. No.
S81 ceiling mount	1176-969
Pre-installation set for new installation	1078-181
Wall socket for S8/S81 CM for foot control panel	1078-524
S8/S81 instrument socket for foot control panel	1141-820
Ceiling panel for S 8 / S81 ceiling mounts	1083-804

A Distance between structural ceiling and false ceiling
(ordered length of pre-installation set)

B Distance between false ceiling and floor

C Distance from floor
We recommend different distances from the floor, depending on the application involved.

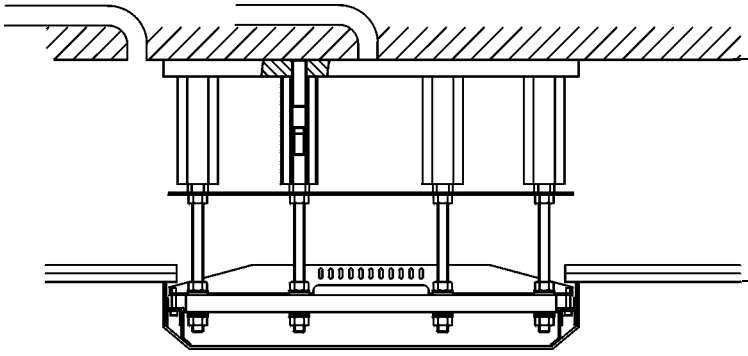
- ENT 1650 mm (65")
- ophthalmology 1800 mm (70.9")
- reconstructive and plastic surgery 1800 mm (70.9")
- others 1650 mm (65")

D Column length (ordered length)
The following formula is used for calculation:
D = B - C - 810 mm (31.9").

Note: **column length (D) >600 mm (>23.6“)** Depending on the type of construction involved, vibrations may have a negative influence if the column length (D) exceeds 600 mm (>23.6“).

- Use column lengths of >600 mm (>23.6“) only in exceptional cases. If on-site conditions permit it, column lengths of >600 mm (>23.6“) can be avoided by selecting an appropriately greater height (A) of the pre-installation set. Should the pre-installation set protrude from the false ceiling, you can cover it using ceiling panel extension (1177-632).

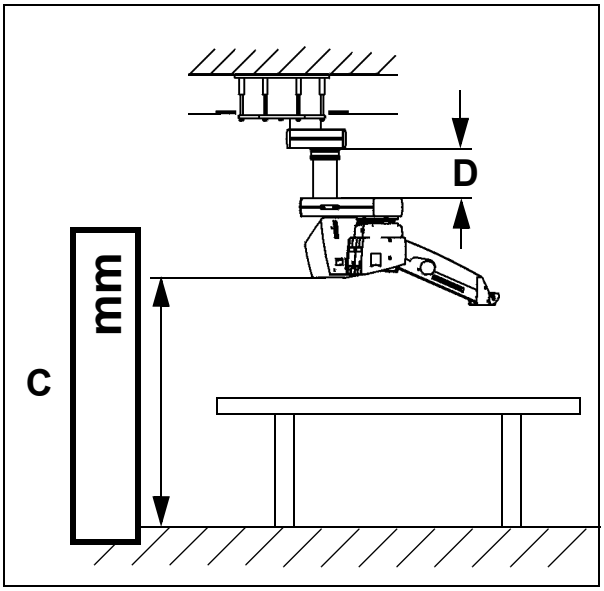
Order sheet for S81 ceiling mount in ORs with false ceilings



A

mm

min 200 mm
max 800 mm



Column length (ordered length):

D = B - C - 810 mm

D = _____ **mm**

min. 40 mm, max. 800 mm*)

*) Recommendation: max. 600 mm, see note on page 54.

Dimensions in inches:

A = _____ "

min. 7.9", max. 31.5"

B = _____ "

C = _____ "

Column length:

D = B - C - 31.9“

D = _____ "

min. 1.6“, max. 31.5“ *)

*) Recommendation: max. 23.6", see note on page 54.

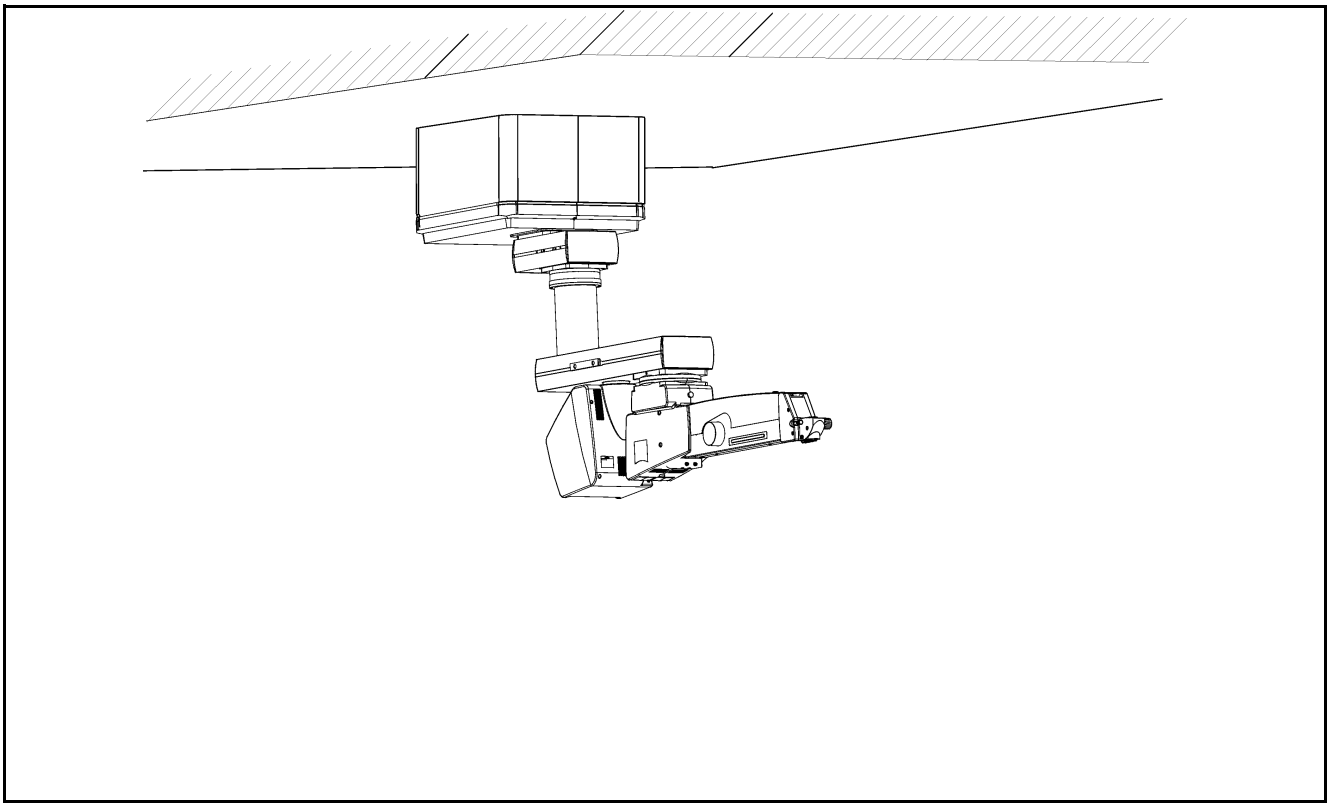
B

mm

S81 ceiling mount for ORs without false ceilings, ordering data

You must order the ceiling mount using the following order sheet only if the OR does not provide a false ceiling.
If the OR does not provide a false ceiling, you will need a cover for the pre-installation set (1078-181). You can order the cover for the pre-installation set as a kit (1139-023).

Description	Cat.No.
S81 ceiling mount	1176-969
Pre-installation set for new installation	1078-181
Cover for pre-installation set	1139-023
Wall socket for S8/S81 CM for foot control panel	1078-524
S8/S81 instrument socket for foot control panel	1141-820
Ceiling panel for S 8 / S81 ceiling mounts	1083-804



Note:
Please note that the relevant dimensions have to be entered in the following drawing for each purchase order.

- Enter the data and enclose a copy of the drawing with your purchase order.

Caution:
Use the following principle for planning the installation of the S81 ceiling mount: Keep the ordered length (A) of the pre-installation set as short as possible and select a longer column length (D) as required.

C Required distance from floor
We recommend defining different distances from the floor, depending on the application involved: ENT 1650 mm (65"), ophthalmology 1800 mm (70.9"), reconstructive and plastic surgery 1800 mm (70.9"), others 1650 mm (65").

H Room height (distance from the floor to the structural ceiling)
- You must exactly measure this height.

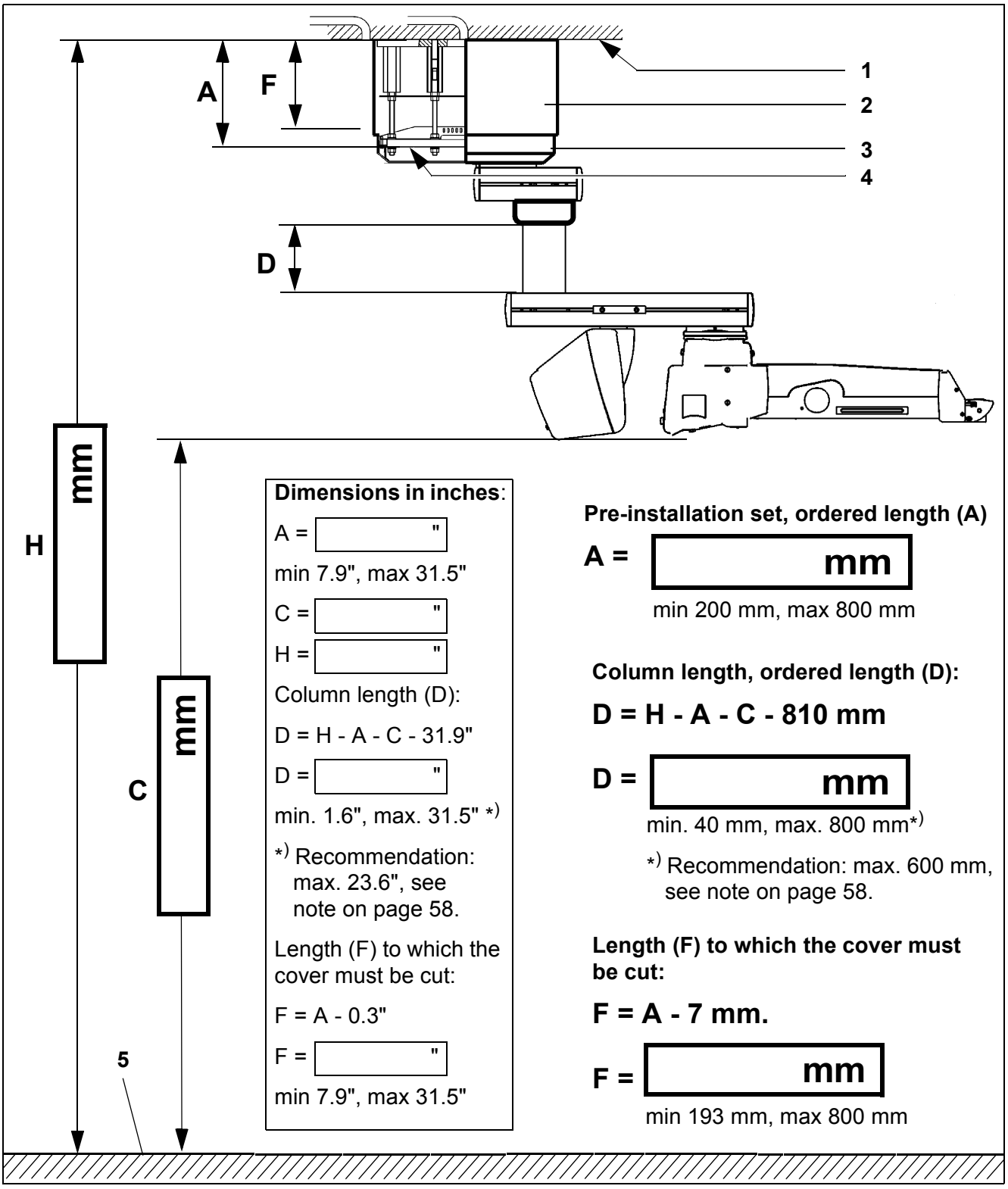
A Ordered height of pre-installation set
Start your planning using the shortest length of 200 mm (7.9").

D Column length (ordered length)
Calculate the column length: **D = H - A - C - 810 mm** (-31.9").
The column length may be a minimum of 40 mm (1.6") and a maximum of 800 mm (31.5").
Note: **column lengths of >600 mm (>23.6“)**
Depending on the type of construction involved, vibrations may have a negative influence if the column length (D) exceeds 600 mm (>23.6“).
- Use column lengths of >600 mm (>23.6“) only in exceptional cases. If on-site conditions permit it, column lengths of >600 mm (>23.6“) can be avoided by selecting an appropriately greater height (A) of the pre-installation set.
  Example: Use the maximum column length (D) of 600 mm (23.6") and calculate the length (A) of the pre-installation set to be ordered using the formula: **A = H - D - C - 810 mm** (-31.9").

F Length to which cover (F) (1139-023) must be cut
Calculate length (F) to which the cover must be cut:
F = A - 7 mm (-0.3").

1 Structural ceiling, bottom surface
2 Cover of the pre-installation set (1139-023)
3 Ceiling panel (1083-804)
4 Mount flange, bottom surface
5 Floor, top surface

Order sheet for S81 ceiling mount in ORs without false ceilings



Dimensions in inches:

A = "

min 7.9", max 31.5"

C = "

H = "

Column length (D):

D = H - A - C - 31.9"

D = "

min. 1.6", max. 31.5" *)

*) Recommendation: max. 23.6", see note on page 58.

Length (F) to which the cover must be cut:

F = A - 0.3"

F = "

min 7.9", max 31.5"

Pre-installation set, ordered length (A)

A = mm

min 200 mm, max 800 mm

Column length, ordered length (D):

D = H - A - C - 810 mm

D = mm

min. 40 mm, max. 800 mm*)

*) Recommendation: max. 600 mm, see note on page 58.

Length (F) to which the cover must be cut:

F = A - 7 mm.

F = mm

min 193 mm, max 800 mm

Accessory interface

Accessory interface

Next to the flange area for the carrier arm of the ceiling mount, the mount flange also features a flange area for an accessory carrier. This is the accessory interface designed as a hole circle, see page 66.

This accessory interface permits you to mount an accessory carrier e.g. for OR illuminators, supports, monitor brackets, trays for video systems or similar devices.

Coupling of the Zeiss system with accessories from other manufacturers

Caution:
The coupling of a system from Carl Zeiss Surgical GmbH with accessories (OR illuminators, monitor brackets or similar) from other manufacturers results in a new medical system for which the creator of the new system must meet the necessary requirements (approval, qualification, structural requirements, etc.).
Please note the user manuals provided by the manufacturer of the accessory modules. Further information is available from our service department or from authorized representatives.

- Check the feasibility of the installation in detail together with the manufacturer of the relevant accessory module (OR illuminator or monitor bracket).

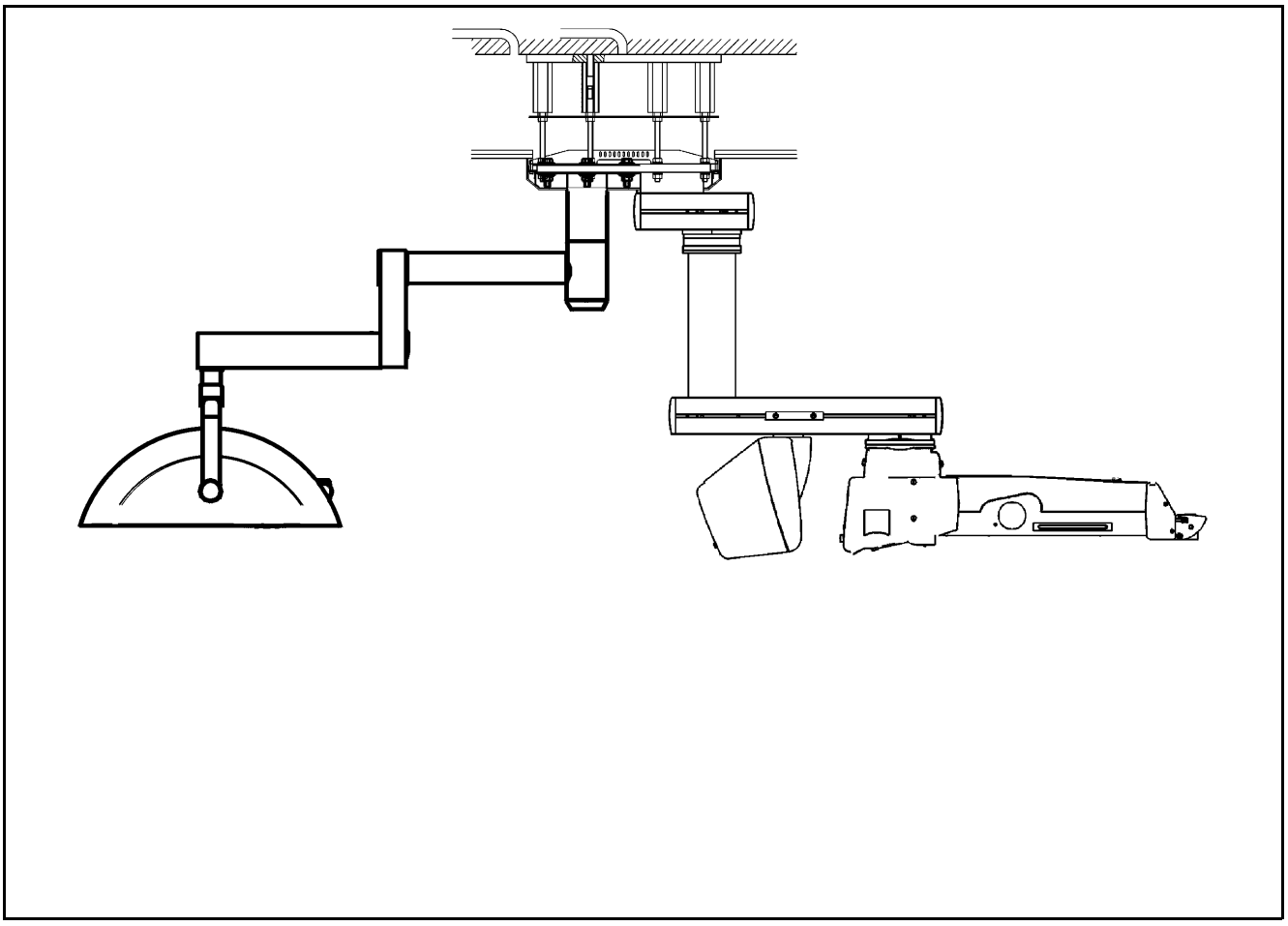
Installation position

Caution:
When defining the positions and ranges of movement of the accessory equipment, please pay attention to the geometry of the respective ceiling mount and to the risk of collisions. For the dimensions, please see:

– illustration on page 7 for S8 ceiling mount.

– illustration on page 8 for S81 ceiling mount.

Note:
The mount flange is usually installed 45 mm (1.8") below the false ceiling. For the dimensions of the pre-installation set, please see the illustration on page 68.



Mount flange and ceiling panel

The S8 or S81 ceiling mount is secured with mount flange (1) on the pre-installation set already installed in the ceiling. In addition to the flange area for the carrier arm of the ceiling mount, the mount flange also features a flange area for an accessory carrier e.g. for attaching an OR illuminator and/or monitor bracket. The mount flange is part of the ceiling mount and is included in its delivery package.

Ceiling panel (2) is used to cover the mount flange and the entire opening in the false ceiling. The opening in the false ceiling must not be larger than 600 mm x 600 mm (23.6" x 23.6"). Two openings are provided in the ceiling panel, one for the ceiling mount and one for an accessory carrier.

Cover frame (3) closes the remaining space between the square tube of the ceiling mount and the ceiling panel.
Blind cover (4) is supplied together with the ceiling panel, permitting the opening for the accessory carrier to be completely closed. You can make an opening in blind cover (4) which fits the accessory carrier used.
A dummy cover is available for closing the opening in the false ceiling until the ceiling mount is installed. Also see page 48 and page 52.

Note:
The S8 or S81 ceiling mount is delivered with the following components already mounted: mount flange (1), cover frame (2) and carrier arm of the ceiling mount (5), as in the configuration example on page 67.

Key

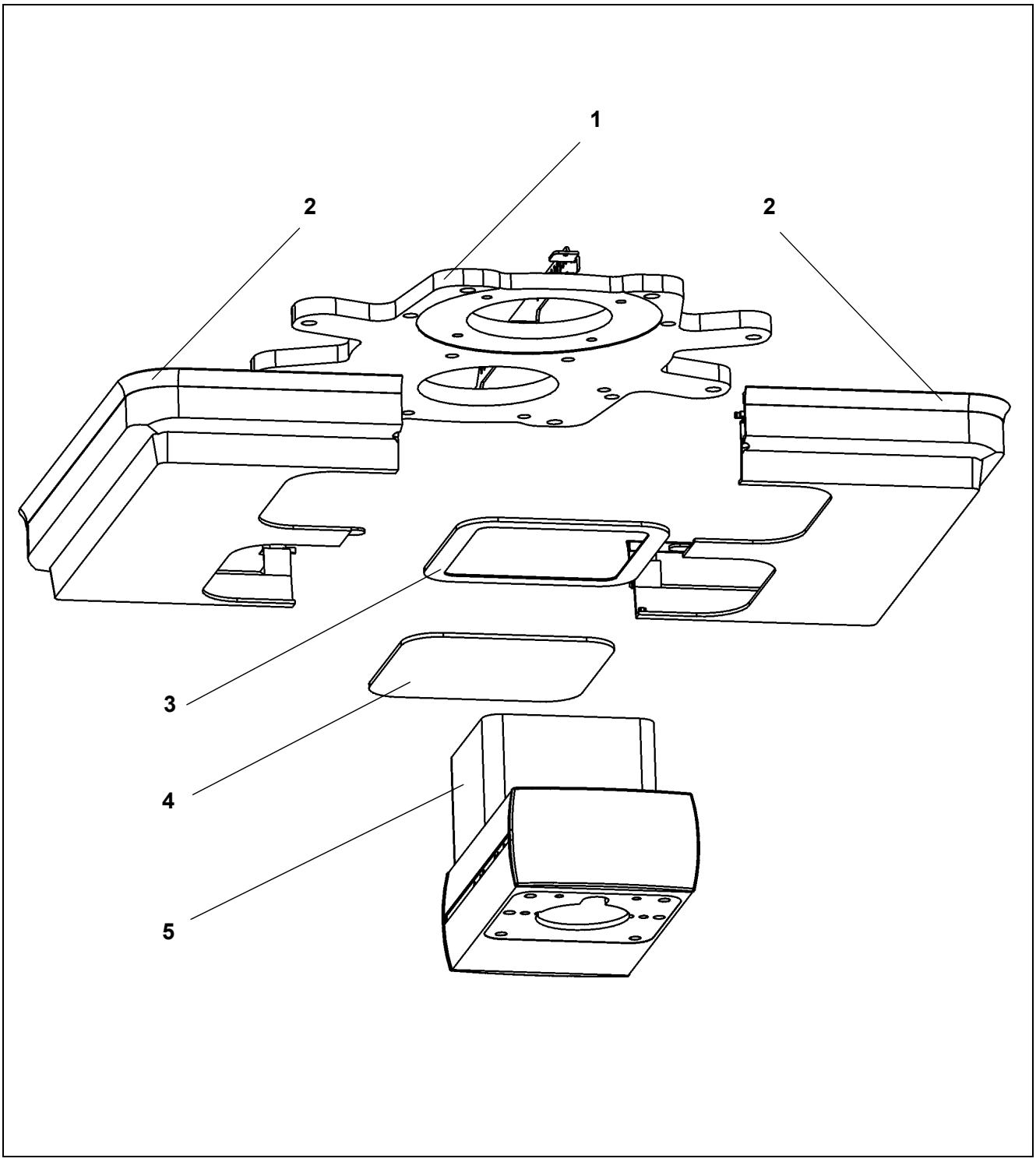
1 Mount flange, part of the ceiling mount.

2 Ceiling panel consisting of two pieces which are fitted together during installation.

3 Cover frame, closes the remaining space between the carrier arm of the ceiling mount (square tube) and the ceiling panel.

4 Blind cover, completely closes the opening for the flange tube in the ceiling panel. You can make an opening in the blind cover as required for the accessory carrier used.

5 Upper part of the carrier arm of the S8 and S81 ceiling mounts, designed as a square tube.


1
2
2
3
4
5

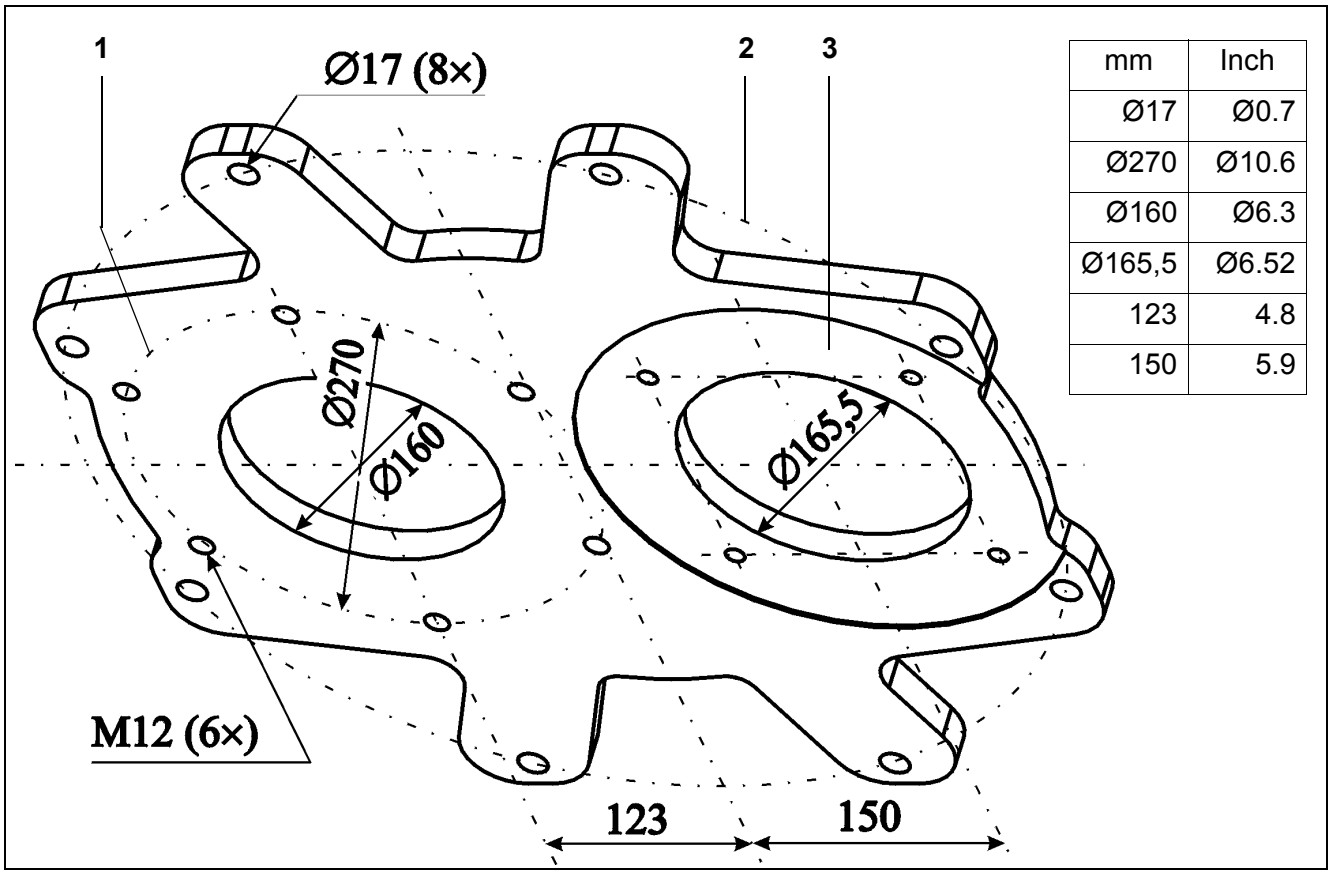
Mount flange (flange plate)

1 Accessory interface (flange area for an accessory carrier) with 6 tapped holes M12 in a hole circle of 270 mm (10.6") dia. Accessories (illuminators, monitor bracket etc.) can be mounted here using an accessory carrier, e.g. a flange tube.

2 Hole circle with 8 bores of 17 mm (0.7") dia. This is the interface for the pre-installation set. The hole circle is used to mount the flange on the stud bolts of the pre-installation set.

3 Flange area for the carrier arm of the ceiling mount The flange area contains four bores arranged in a square. On delivery, the carrier arm of the ceiling mount (square tube) is attached to this flange surface.

Mount flange, bottom view



mm	Inch
Ø17	Ø0.7
Ø270	Ø10.6
Ø160	Ø6.3
Ø165,5	Ø6.52
123	4.8
150	5.9

Configuration example: mount flange with flange tube

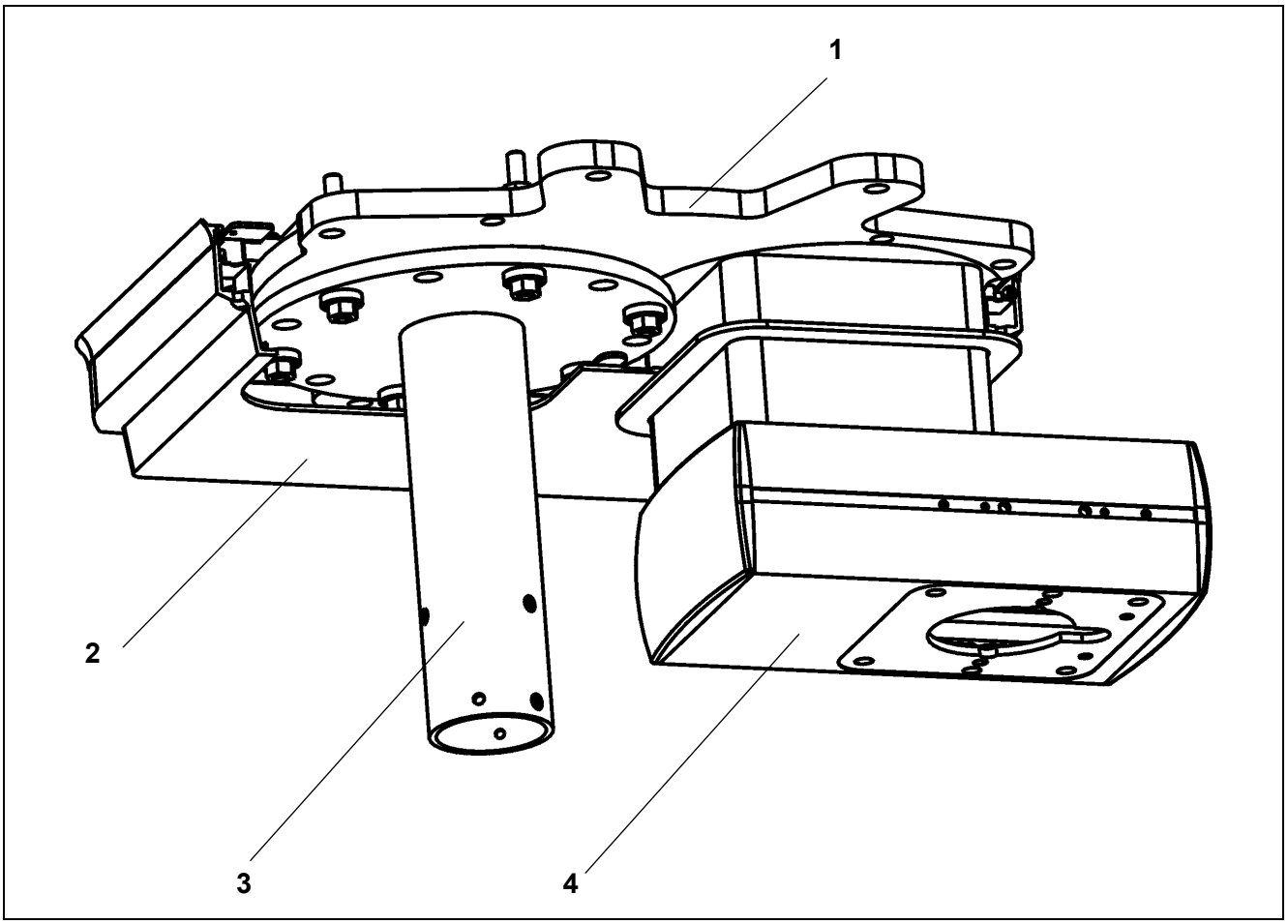
1 Mount flange

2 Ceiling panel
Only one piece of the ceiling panel is shown.

3 Flange tube (example)
A flange tube of this type can be used for mounting accessories (illuminators, monitor mount, etc.).

4 Upper part of the carrier arm
The upper part of the carrier arm of the S8 and S81 ceiling mounts consists of a square tube.

Mount flange with flange tube, bottom view



Pre-installation set

1 Stud bolt

2 Spacers

3 Ceiling anchor plate

4 Floor

5 Ceiling panel

6 Mount flange

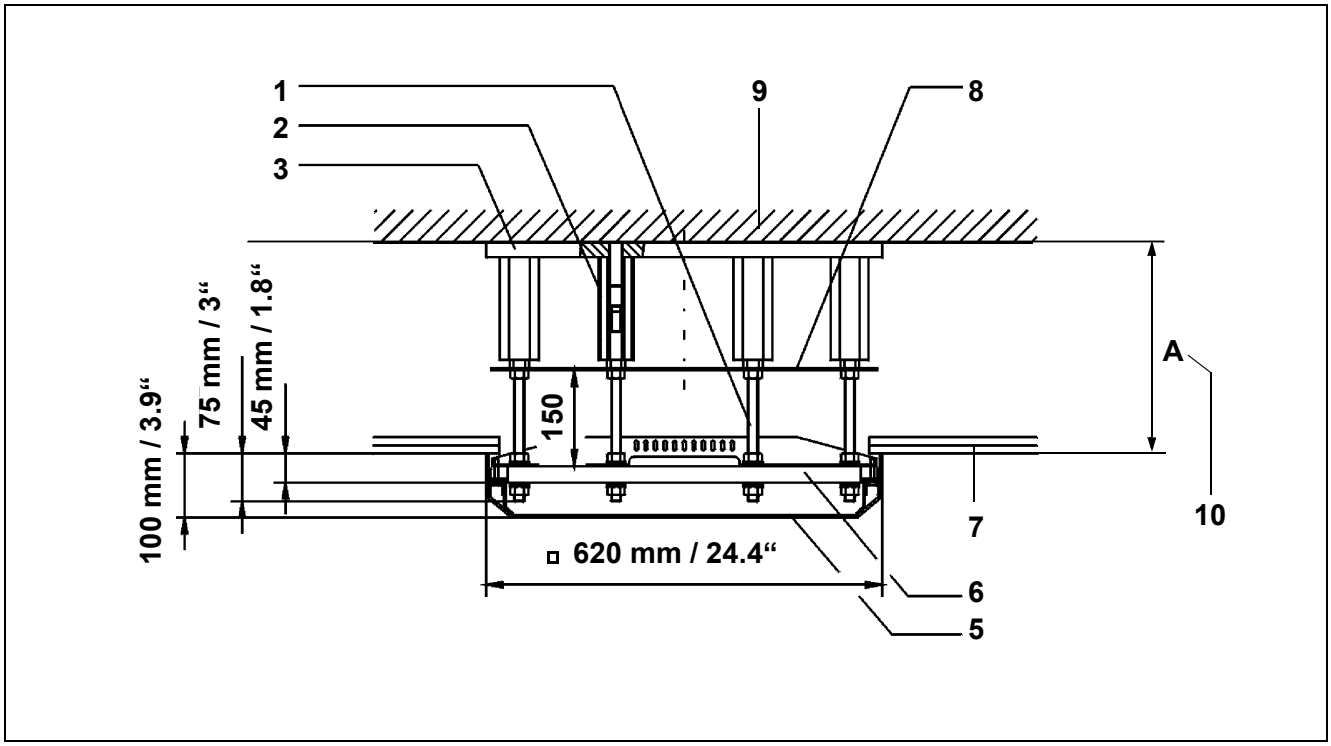
7 False ceiling

8 Interface plate

9 Structural ceiling

10 Dimension **A**
is the distance between the structural ceiling and false ceiling.

Mount flange (6) and ceiling panel (5) are part of the ceiling mount and are only shown here for information. They are not included in the pre-installation set.



Customer's responsibilities

Note:
Zeiss service staff can install the ceiling mount only if all points of the following checklist applicable to the relevant installation conditions have been fulfilled.

The actual load on the ceiling depends on a large number of different factors, which must be determined in detail by a structural engineer on a case-to-case basis: see "Constructional requirements for ceiling mounts" on page 29.

Caution:

- Your structural engineer must separately take into account the additional perpendicular force and additional torque produced by accessories mounted on the accessory interface, i.e. he must add them to the perpendicular force and torque caused on the ceiling by the ceiling mount alone.
- Make sure that a structural engineer checks the installation conditions during the planning procedure.
  Structural verification must be performed prior to the installation of the mount.
  We recommend filing the structural verification in the ceiling mount documentation.
- Obtain a written confirmation from a structural engineer stating that the applicable national codes and regulations have been complied with.
- Please add a copy of the "Confirmation of structural calculation" to your order (see page 73).
- If any differences exist between the planning documents and the actual on-site situation, please inform your contact at Carl Zeiss or the planning expert prior to the installation of the pre-installation set.
- On-site conditions also include building vibrations, which the structural engineer responsible must take into account right during the planning phase (see page 26).
  Obtain a written confirmation from your structural engineer stating that possible building vibrations have been taken into account (see page 73).

Forces and torques

Warning!
The structural engineer must ensure in each individual case that the structural ceiling has a sufficient load capacity for the forces and torques listed below. He must also take into account any additional loads on the ceiling and add an appropriate safety margin, and must observe the applicable national codes and regulations.

Note:
The maximum permissible perpendicular force and the maximum permissible torque for the accessory interface result from the difference between the maximum permissible values for the pre-installation set and ceiling mount, i.e. pre-installation set - ceiling mount = accessory interface.

Pre-installation set
The pre-installation set can accept the following maximum perpendicular force and maximum torque:

- Perpendicular force: max. 6200 N (min. 1393 lbf)
- Torque: max. 9500 Nm (max. 7007 lbf.ft)

Since the pre-installation set is subjected to the following maximum perpendicular force and maximum torque by the ceiling mount:

- perpendicular force: min. 2500 N (min. 565 lbf)
- torque: min. 3000 Nm (min. 2215 lbf.ft)

the following maximum perpendicular force and maximum torque remain for the accessories:

Accessory interface (maximum)

- **Perpendicular force: max. 3700 N (max. 832 lbf)**
- **Torque: max. 6500 Nm (max. 4794 lbf.ft)**

Electrical connections for accessory modules

The power supply for the electrical accessory components can be connected to connectors "A" on the interface plate (connectors for OR illuminators, terminal blocks B and C).

On-site requirements for the connection of accessories

- Route the power lines in the building up to the interface plate.
- Route any required control lines and/or monitor connections in the building up to the interface plate.
- Make sure (for in-wall installation) that a sufficient number of conduits with sufficient cross section are provided.
- Route additional lines for potential equalization to the terminals on the interface plate.

Warning!

– The planning, execution and inspection of the on-site electrical installations must be performed by expert electrical technicians and officially registered electrical firms.

– The electrical installations of the room concerned must comply with the requirements of the applicable national regulations. In the Federal Republic of Germany, VDE 0107 applies.

– The number of circuits is dependent on the customer's specific carrier system configuration.

– If several circuits are required by the customer, appropriate allowance must be made on the interface plate.

– Multiwire lines must be provided with wire end sleeves.

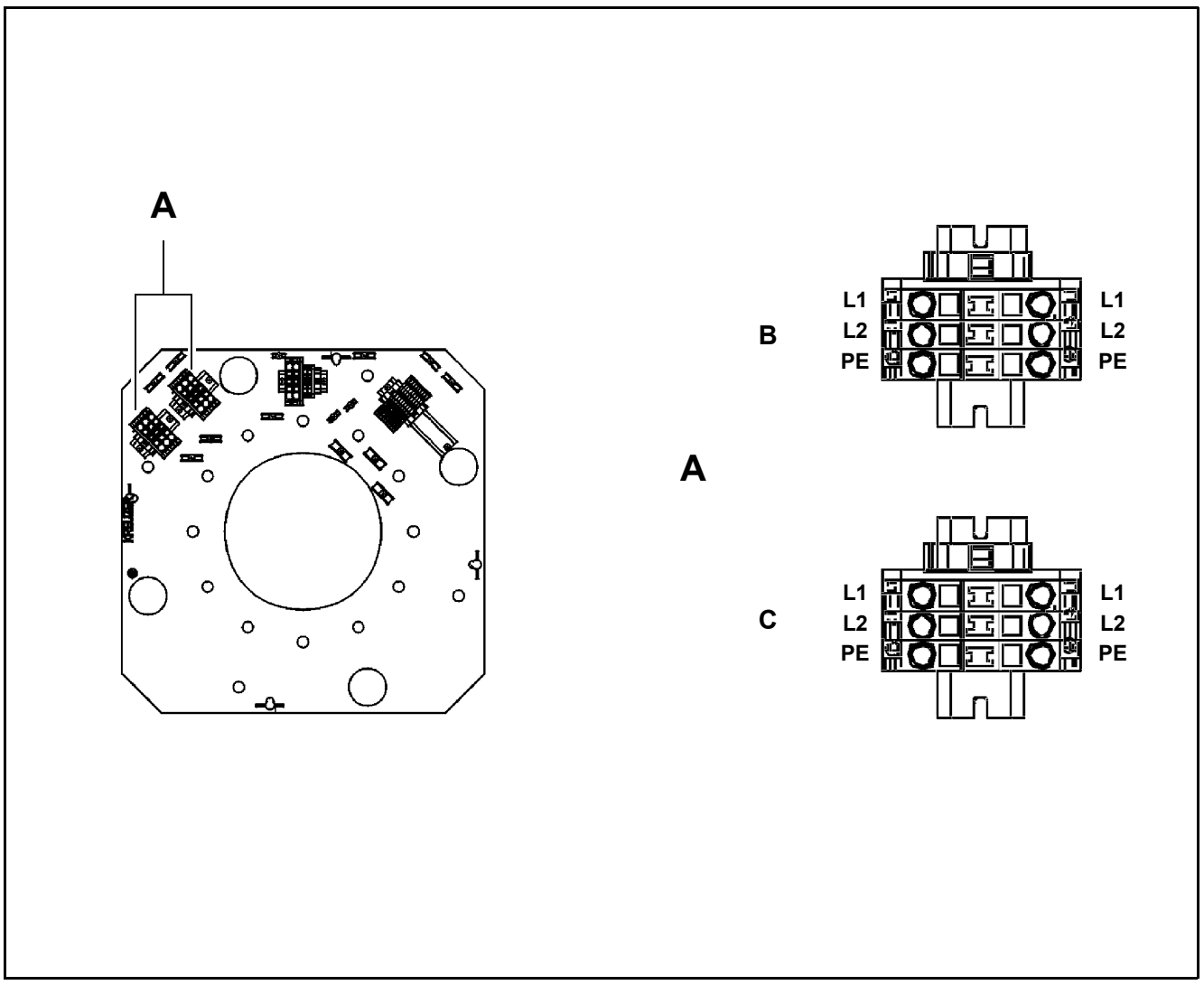
Key

A Connectors for OR illuminators

B Terminal 1 for OR illuminator 1
Maximum terminal cross section = 16 mm2 (AWG 6)

C Terminal 2 for OR illuminator 2
Maximum terminal cross section = 16 mm2 (AWG 6)

For details of the other terminals, see the section "On-site electrical installation", page 38.



Confirmation of the structural calculation and execution of installation

Sales order no.: .....

Customer address /
Delivery address: .....
.....
.....

By signing below, the following persons confirm that they have performed their work in a proper and orderly way:

The **structural engineer** for

- the selection and layout of the installation site, taking possible building vibrations into account
- the structural calculation, taking into account the applicable national regulations and the planning manual
- the structural checking of an existing substructure
- the structural calculation of a substructure built on site
- the final checking and release of the structural calculations:

Name and address of
the structural engineer: .....
.....
.....

....

Date Signature

The **installer** for
the proper mounting of the pre-installation set or the ceiling or wall flange from Carl Zeiss**:**

Name and address of
the executing company
and installer's name: .....
.....
.....
.....

....

Date Signature

Discipline-specific installation positions

The various surgical disciplines and on-site conditions require different installation positions of the S8 and S81 ceiling mounts.

This chapter describes a number of recommended installation positions of the S8 and S81 ceiling mounts for different surgical disciplines.

Note:
In unfavorable on-site conditions, the recommended installation positions must be changed appropriately. In cramped conditions, the use of OR illuminators is only possible with restrictions or indeed not at all.

Caution:
The recommended discipline-specific installation positions do not release you from the responsibility of careful planning. Only careful planning will ensure a smooth, collision-free workflow during surgery.

Scale 1:20

All recommended, discipline-specific installation positions are shown at a scale of 1:20 and can usually be directly incorporated in the layout plan.

Transparent film

It may also be helpful for your planning work if you copy the scale 1:20 discipline-specific installation positions to transparent film. You can then place the transparent film on the layout plan, and bring it into a suitable position by shifting and turning it.

Note:
In the following illustrations, the representation of the ceiling mount in light gray, dotted lines shows the alternative, mirrored (laterally reversed) installation option.

Installation positions for ophthalmology and ENT

The S8 or S81 ceiling mount is used for ophthalmology and ENT.

Recommendations for ophthalmology

Preferred installation position for ophthalmology
The S8 or S81 ceiling mount is positioned above the patient's foot area (centered relative to the operating table).

Alternative installation position for ophthalmology
The S8 or S81 ceiling mount is positioned laterally to the patient (centered relative to the patient's head).

Recommendation for ENT

General
Two OR illuminators are normally used for ENT. Do not mount these OR illuminators (ceiling lights) on the mount flange of the ceiling mount, but on separate ceiling flanges. Otherwise, collisions are liable to occur if both ceiling lights are pointed at the surgical field at an angle from behind the surgeon.

Preferred installation position for ENT
The S8 or S81 ceiling mount is centered above the operating table.
The OR illuminators are not mounted on the flange of the ceiling mount, but on separate ceiling flanges.

Alternative installation position for ENT
The S8 or S81 ceiling mount is installed in a centered position behind the patient's head.
Again, the OR illuminators are not mounted on the flange of the ceiling mount, but on separate ceiling flanges.

Key for the following drawings

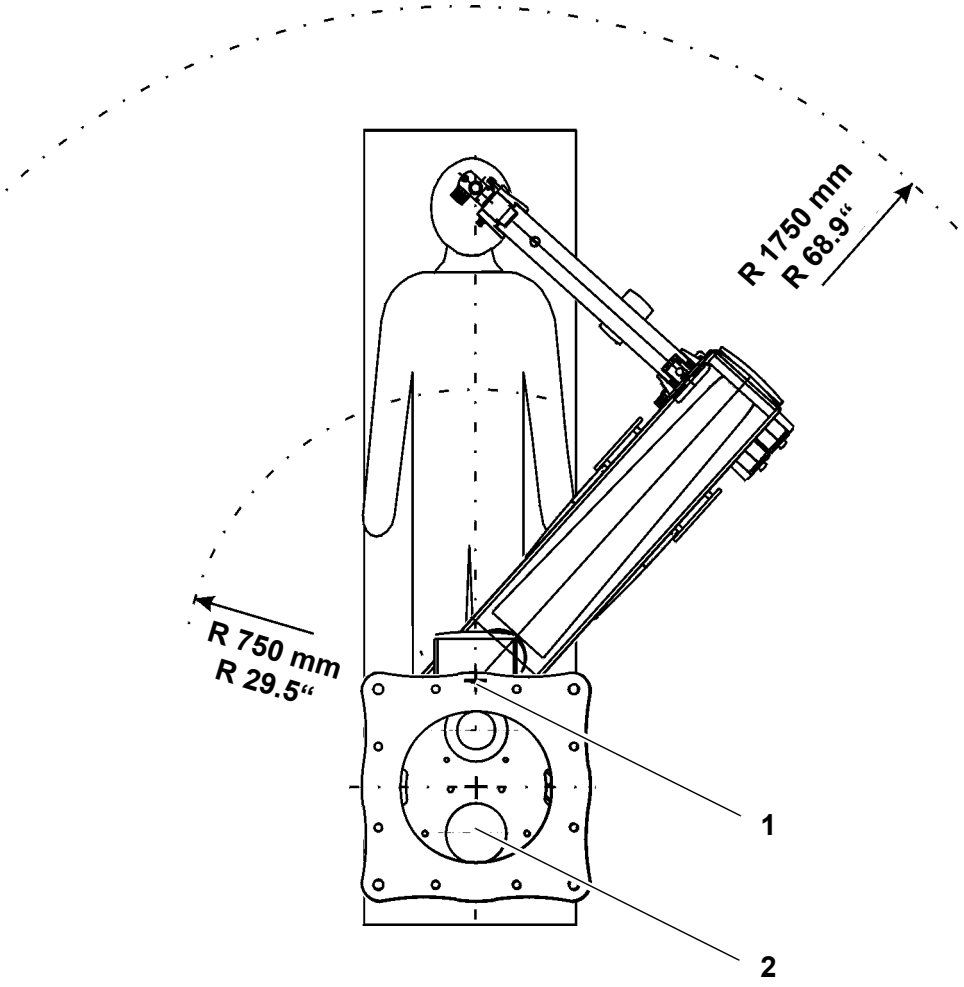
1 Pivot point of the ceiling mount

2 Flange area for an accessory carrier

Preferred installation position for ophthalmology and ENT

S8 ceiling mount positioned above the patient's foot area (centered relative to the operating table). Flange area for accessory carrier (2) in outward position.

S8

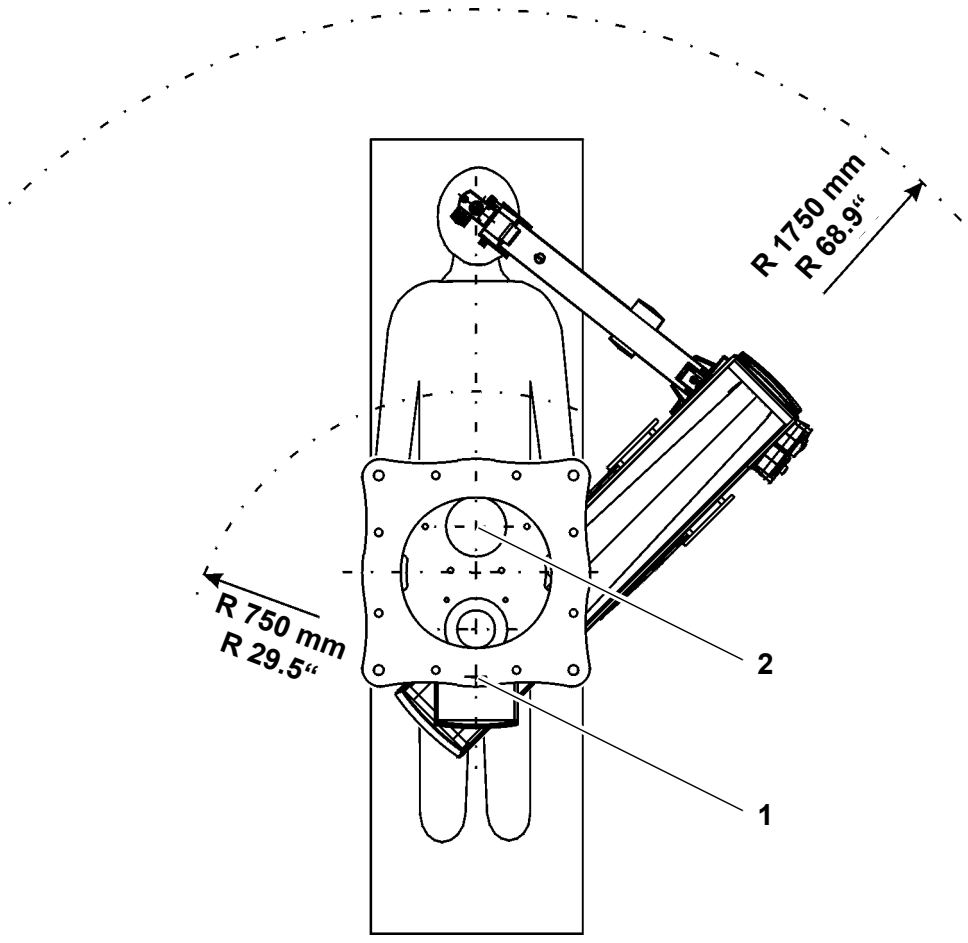


M 1:20

Preferred installation position for ophthalmology and ENT

S8 ceiling mount positioned above the patient's foot area (centered relative to the operating table). Flange area for accessory carrier (2) in inward position.

S8

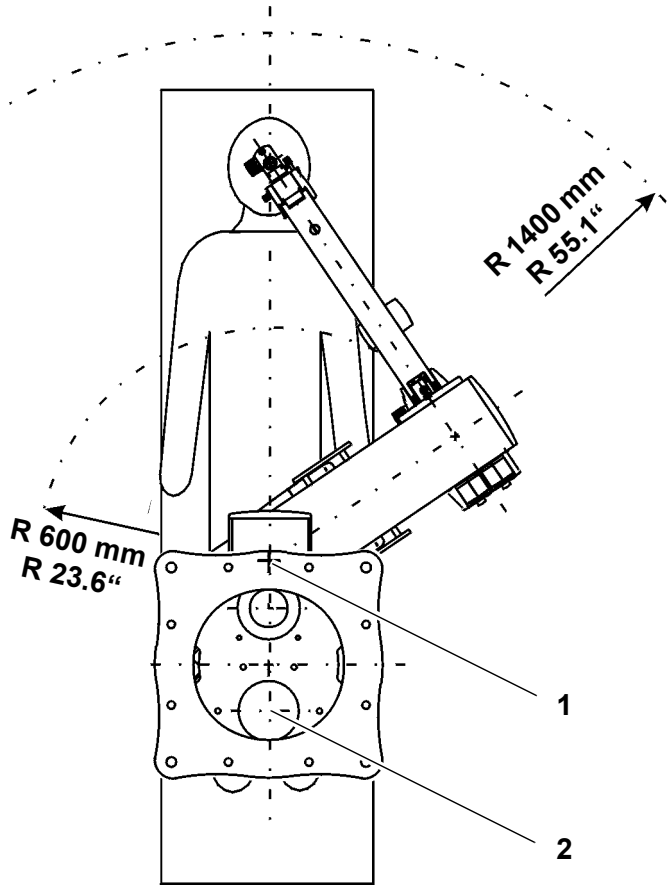


M 1:20

Preferred installation position for ophthalmology and ENT

S81 ceiling mount positioned above the patient's foot area (centered relative to the operating table). Flange area for accessory carrier (2) in outward position.

S81

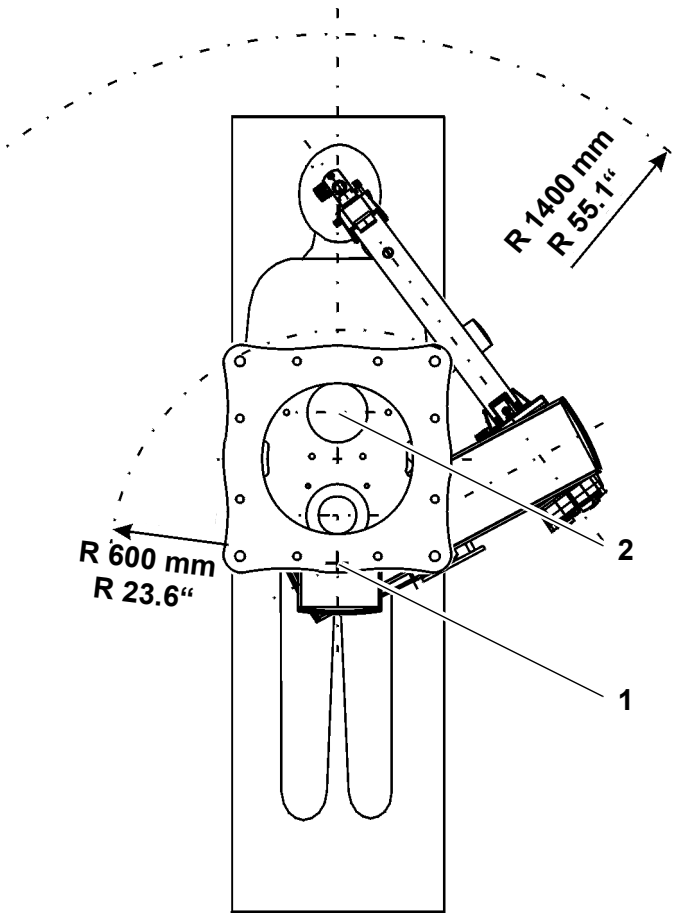


M 1:20

Preferred installation position for ophthalmology and ENT

S81 ceiling mount positioned above the patient's foot area (centered relative to the operating table). Flange area for accessory carrier (2) in inward position.

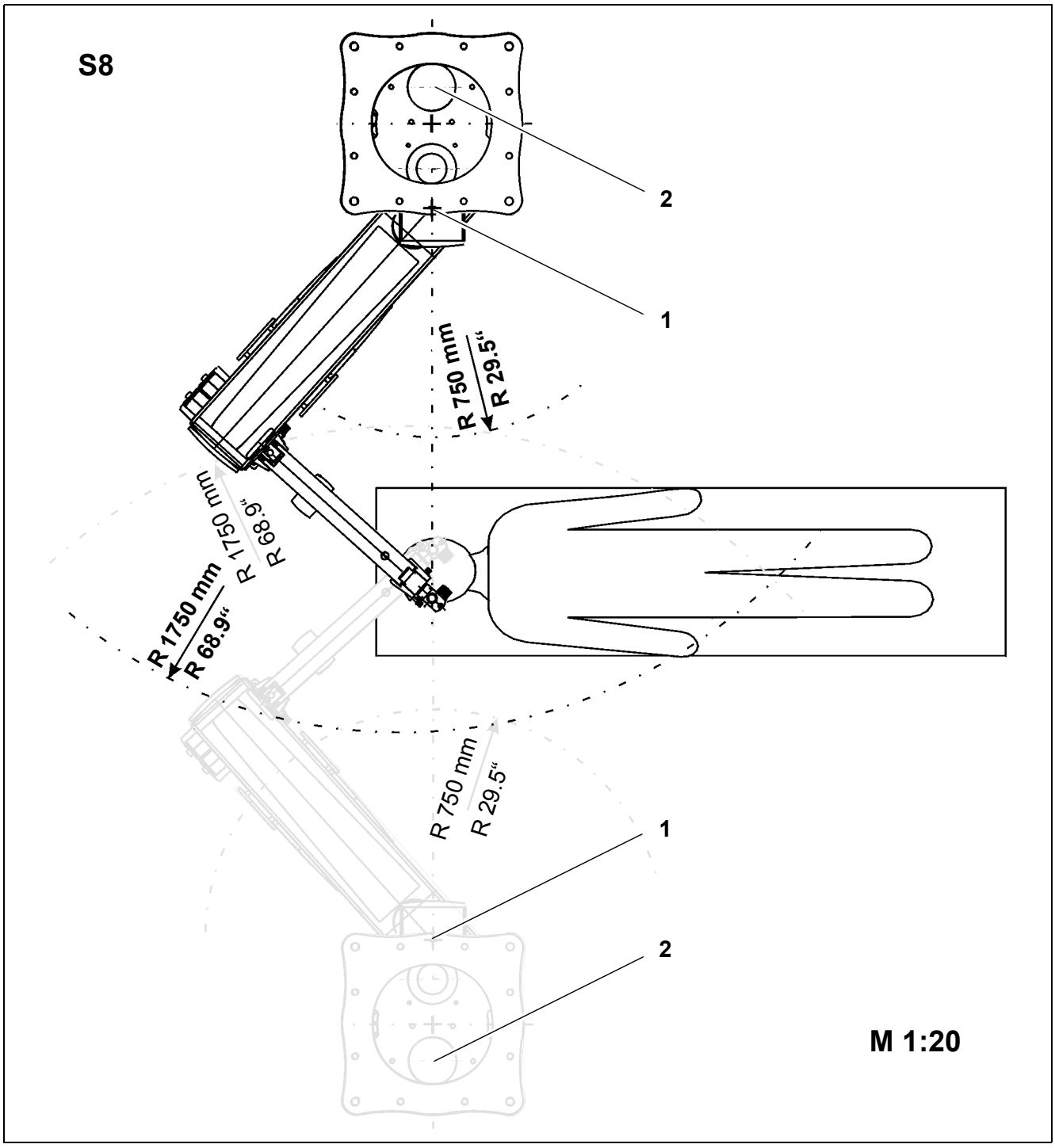
S81



M 1:20

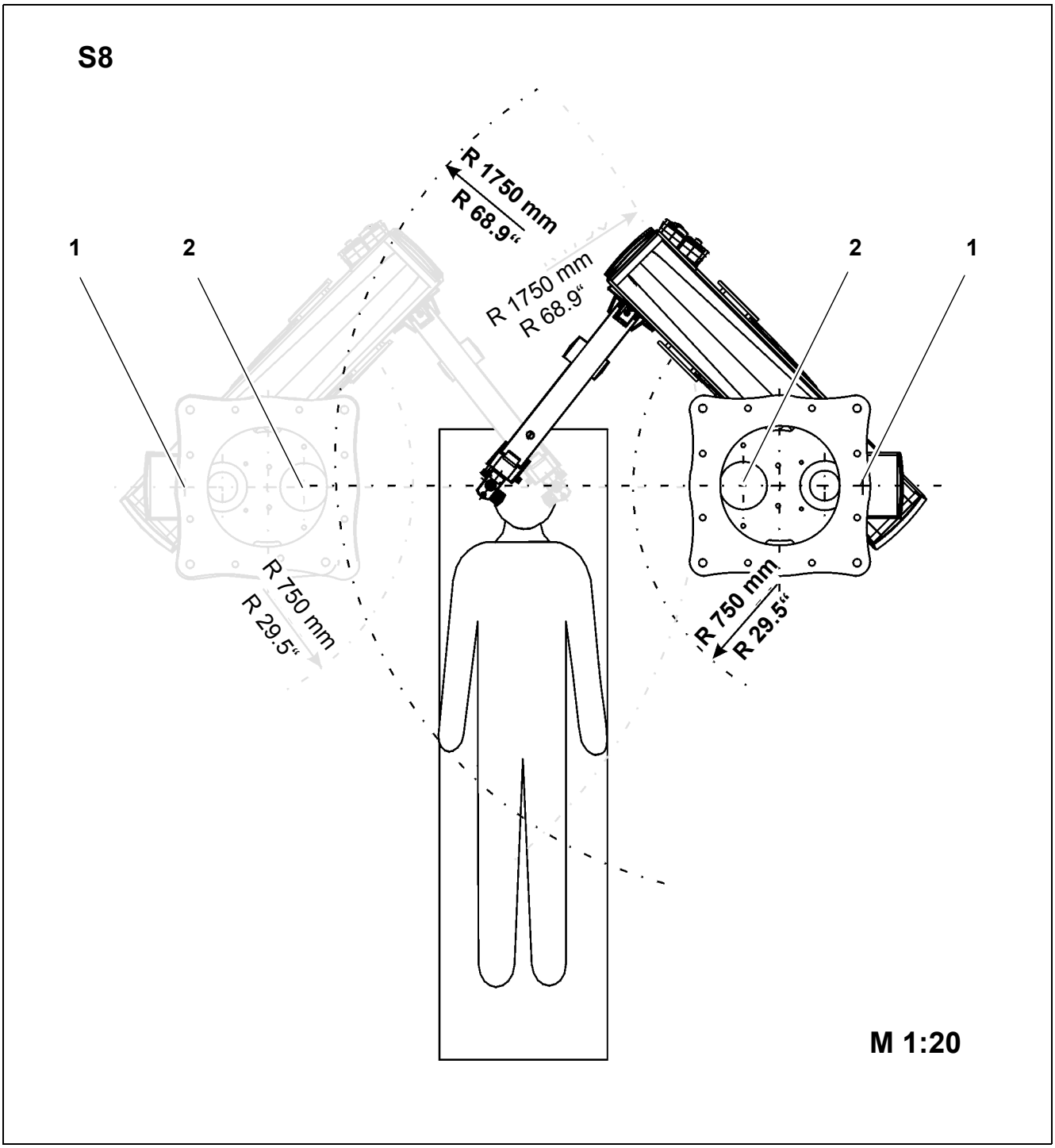
Alternative installation position for ophthalmology

S8 ceiling mount positioned laterally to the patient (centered relative to the patient's head). Flange area for accessory carrier (2) in outward position.



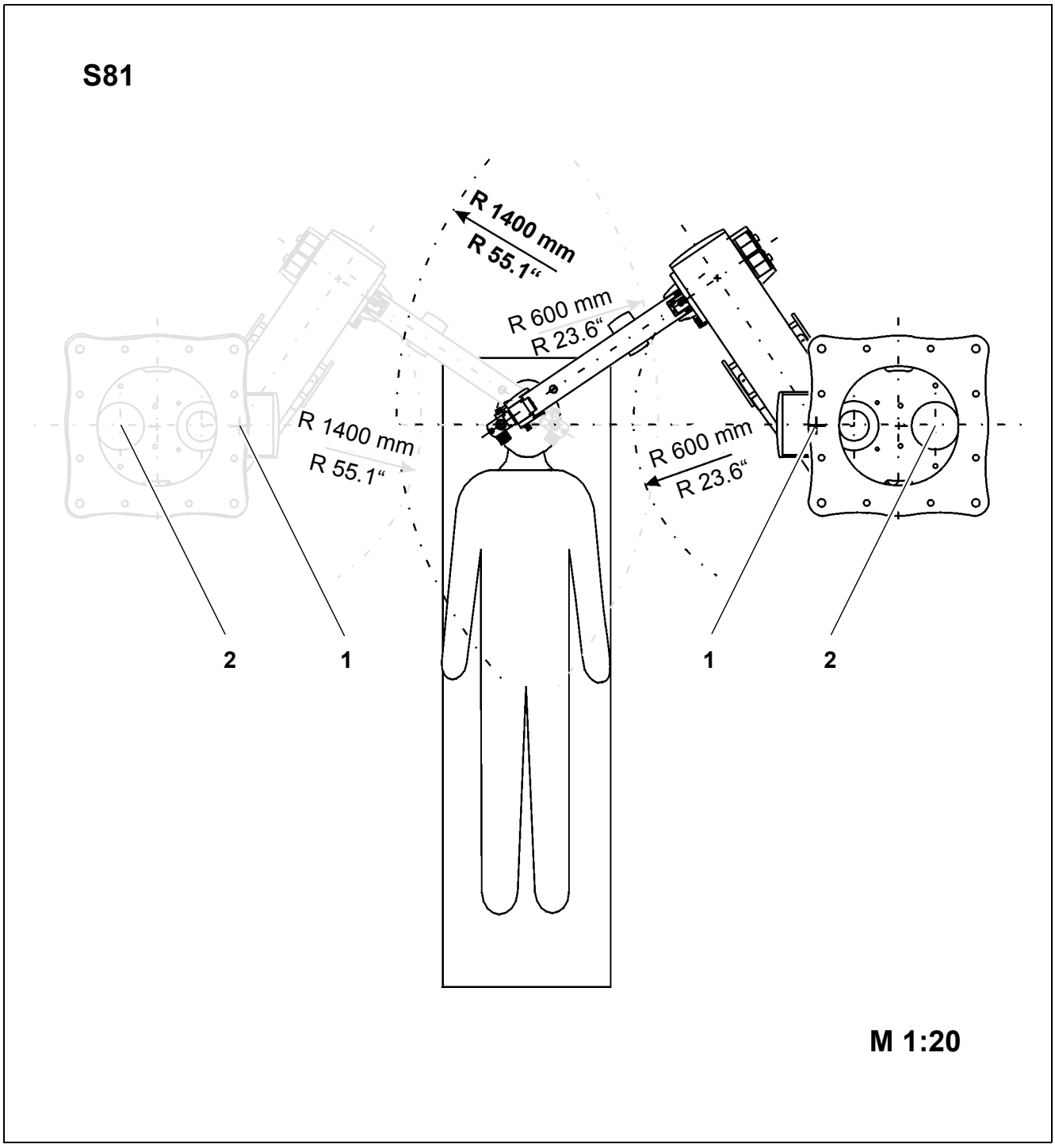
Alternative installation position for ophthalmology

S8 ceiling mount positioned laterally to the patient (centered relative to the patient's head).Flange area for accessory carrier (2) in inward position.



Alternative installation position for ophthalmology

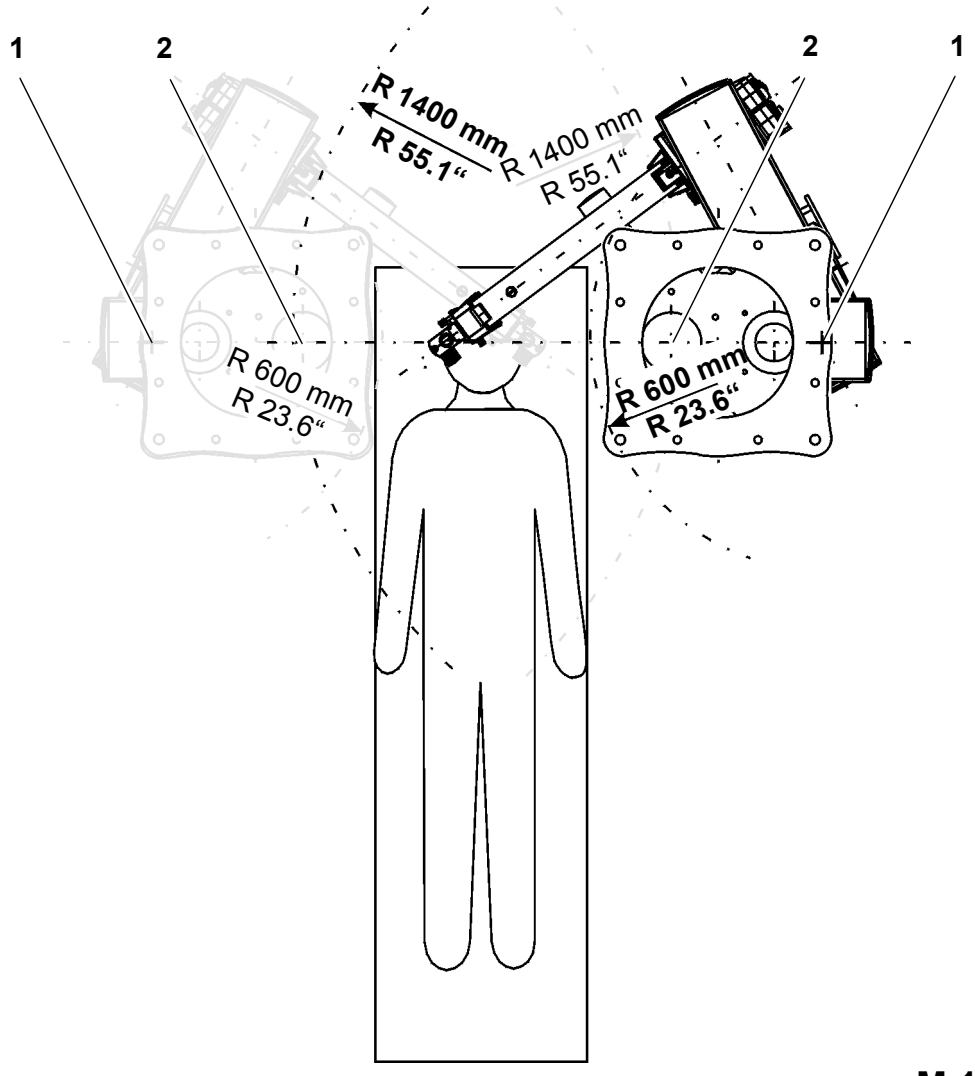
S81 ceiling mount positioned laterally to the patient (centered relative to the patient's head). Flange area for accessory carrier (2) in outward position.



Alternative installation position for ophthalmology

S81 ceiling mount positioned laterally to the patient (centered relative to the patient's head). Flange area for accessory carrier (2) in inward position.

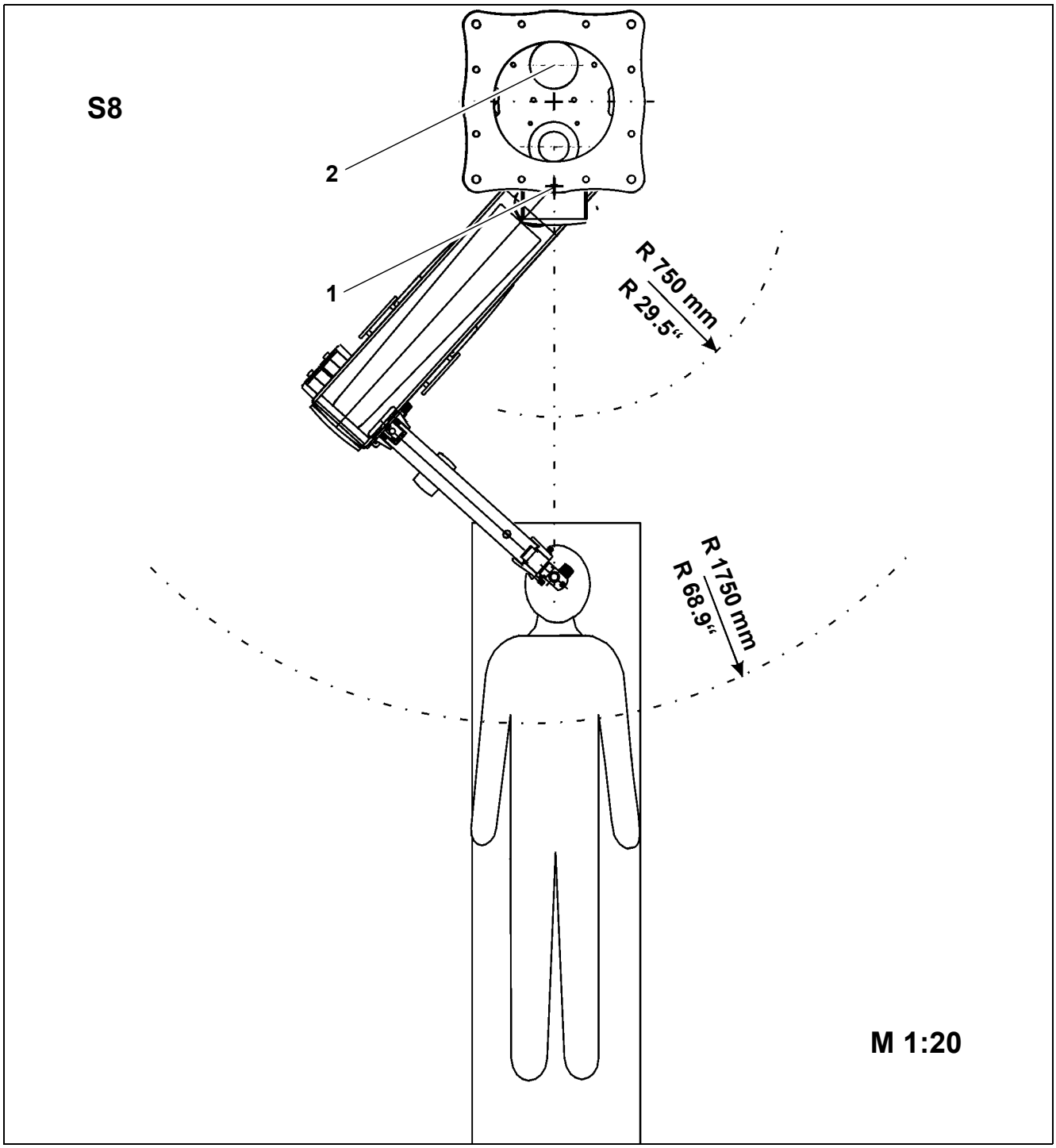
S81



M 1:20

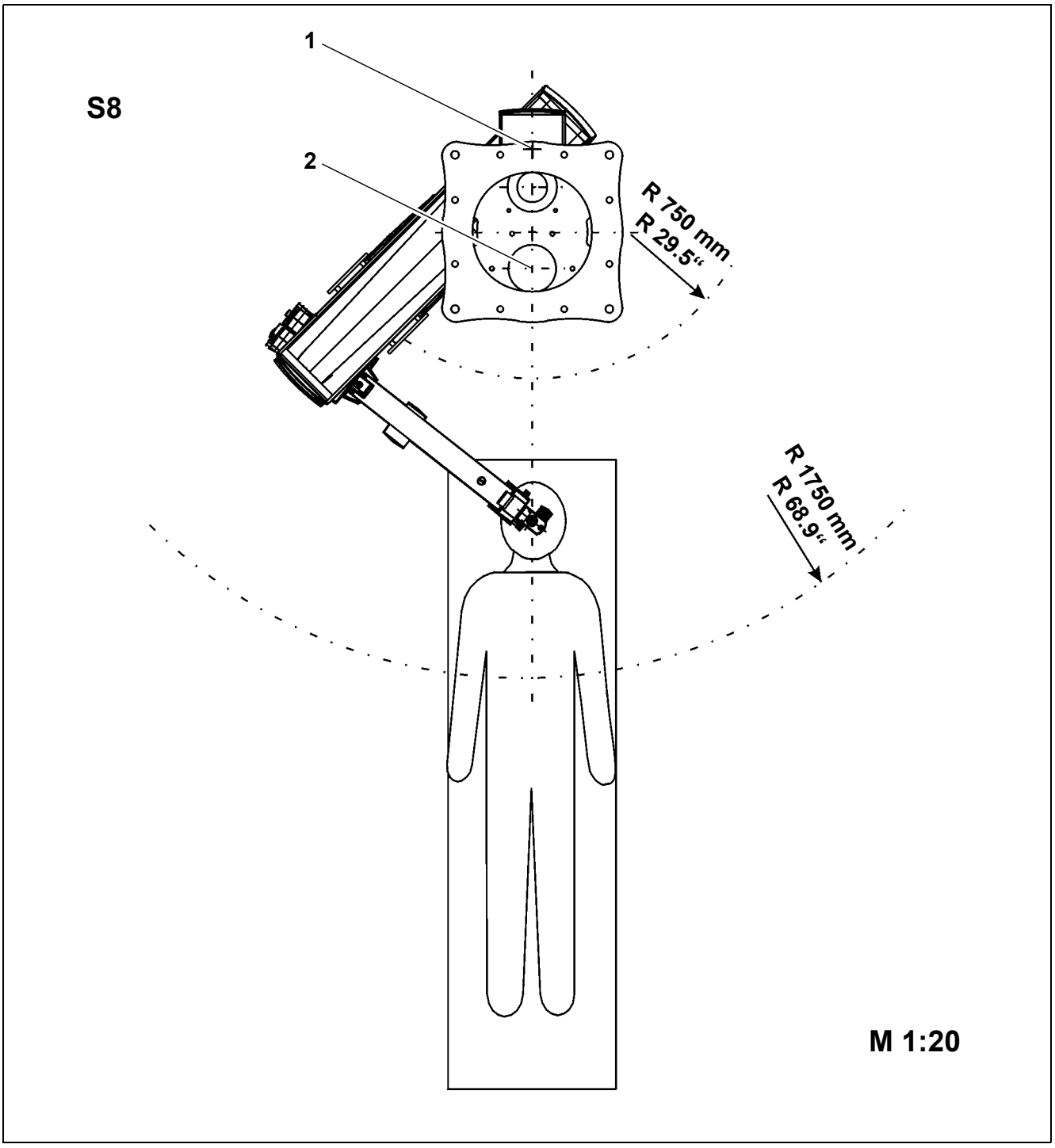
Alternative installation position for ENT

S8 ceiling mount positioned behind the patient's head. Flange area for accessory carrier (2) in outward position.



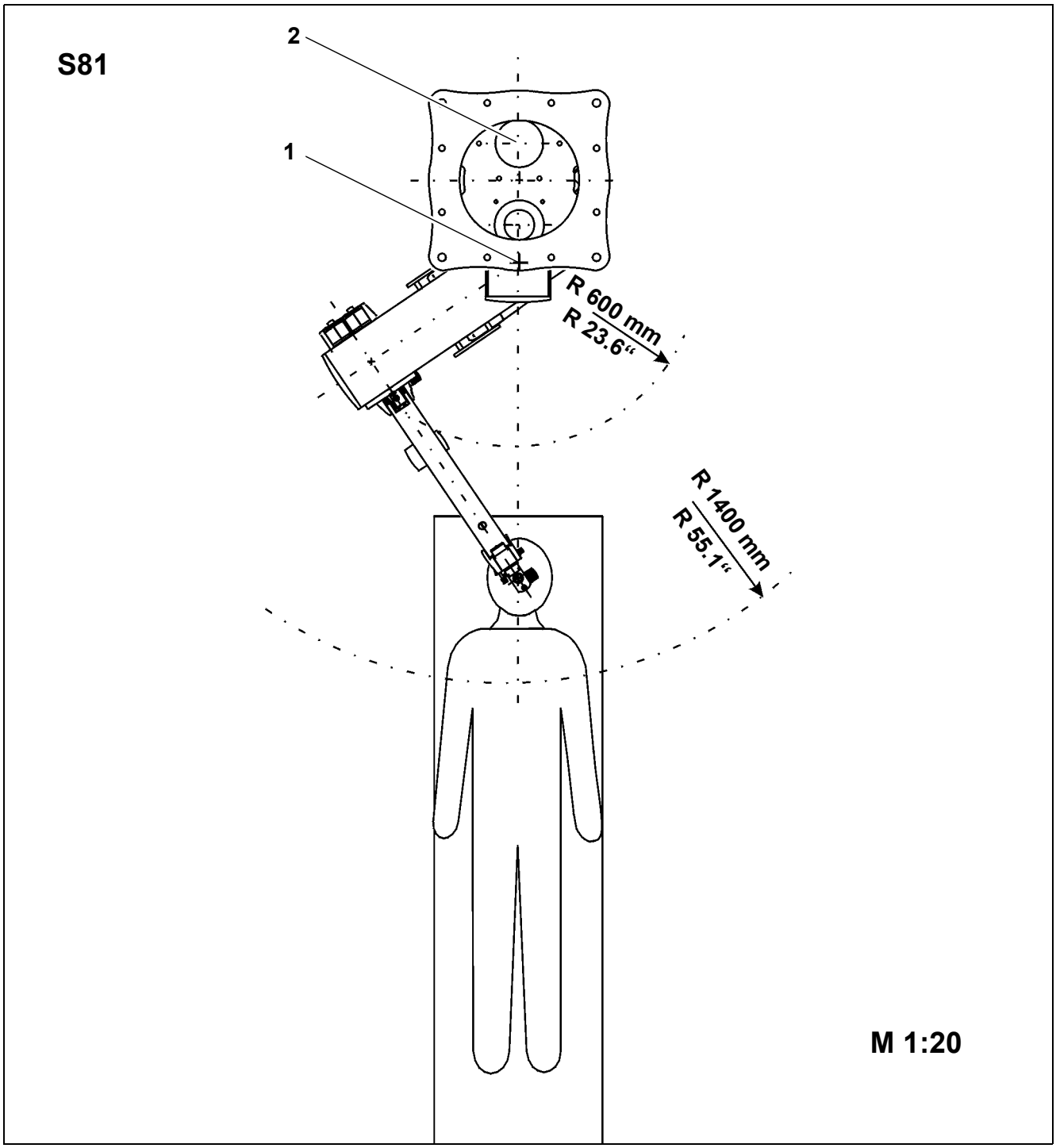
Alternative installation position for ENT

S8 ceiling mount positioned behind the patient's head. Flange area for accessory carrier (2) in inward position.



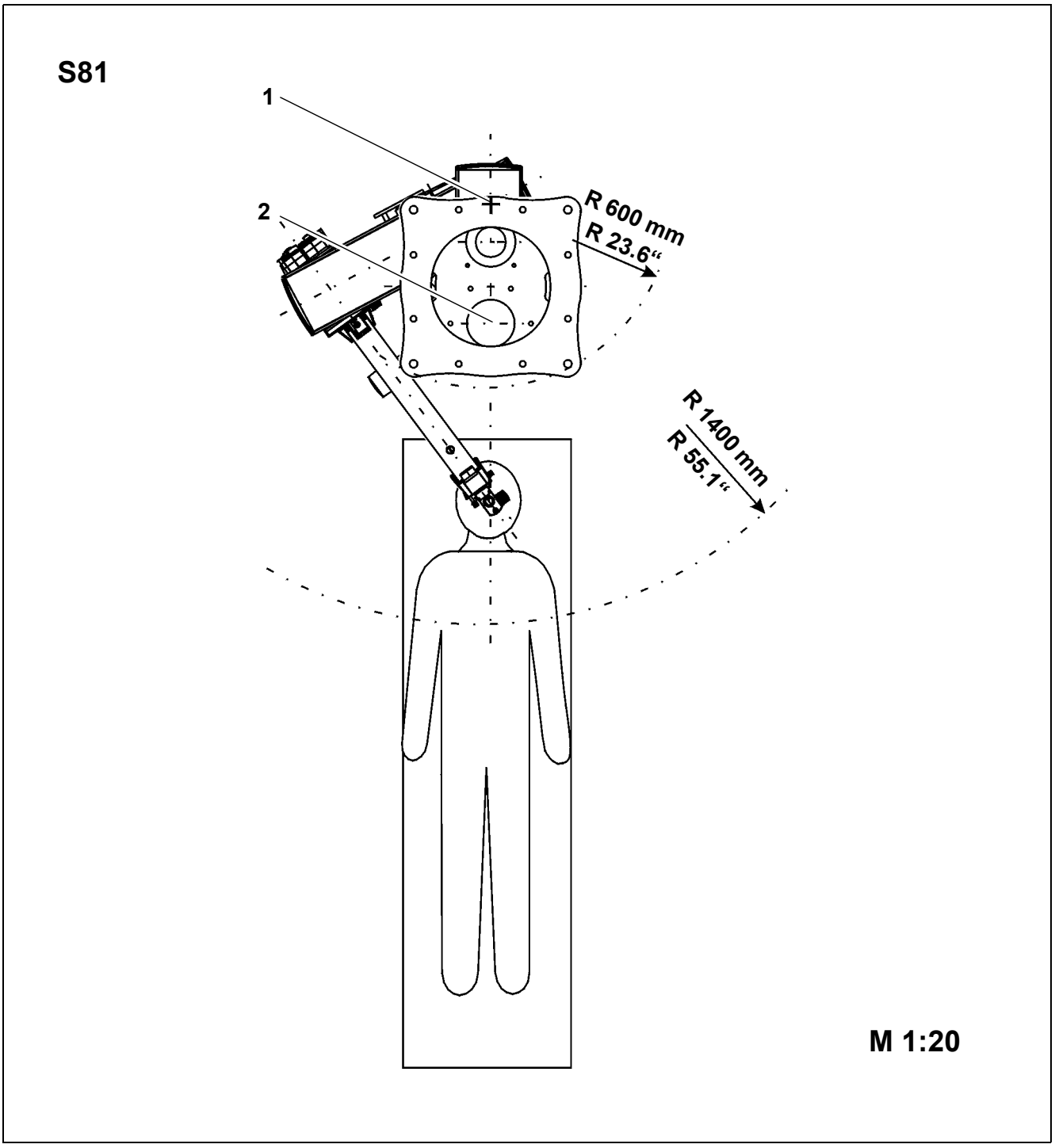
Alternative installation position for ENT

S81 ceiling mount positioned behind the patient's head. Flange area for accessory carrier (2) in outward position.



Alternative installation position for ENT

S81 ceiling mount positioned behind the patient's head. Flange area for accessory carrier (2) in inward position.



Installation position for P&R, Hand

The S8 ceiling mount is used for P&R and hand surgery.

The installation positions recommended in this chapter are also suitable for the following applications:

– ENT

– Neurology

– Urology

– Oral and maxillofacial

– Spine (limited suitability).

Note:
In P&R surgery, one or the other of the patient's hand may sometimes be difficult to reach. In such cases, there is usually the possibility of turning the operating table in such a way that the hand concerned is brought within the optimum working range of the ceiling mount.

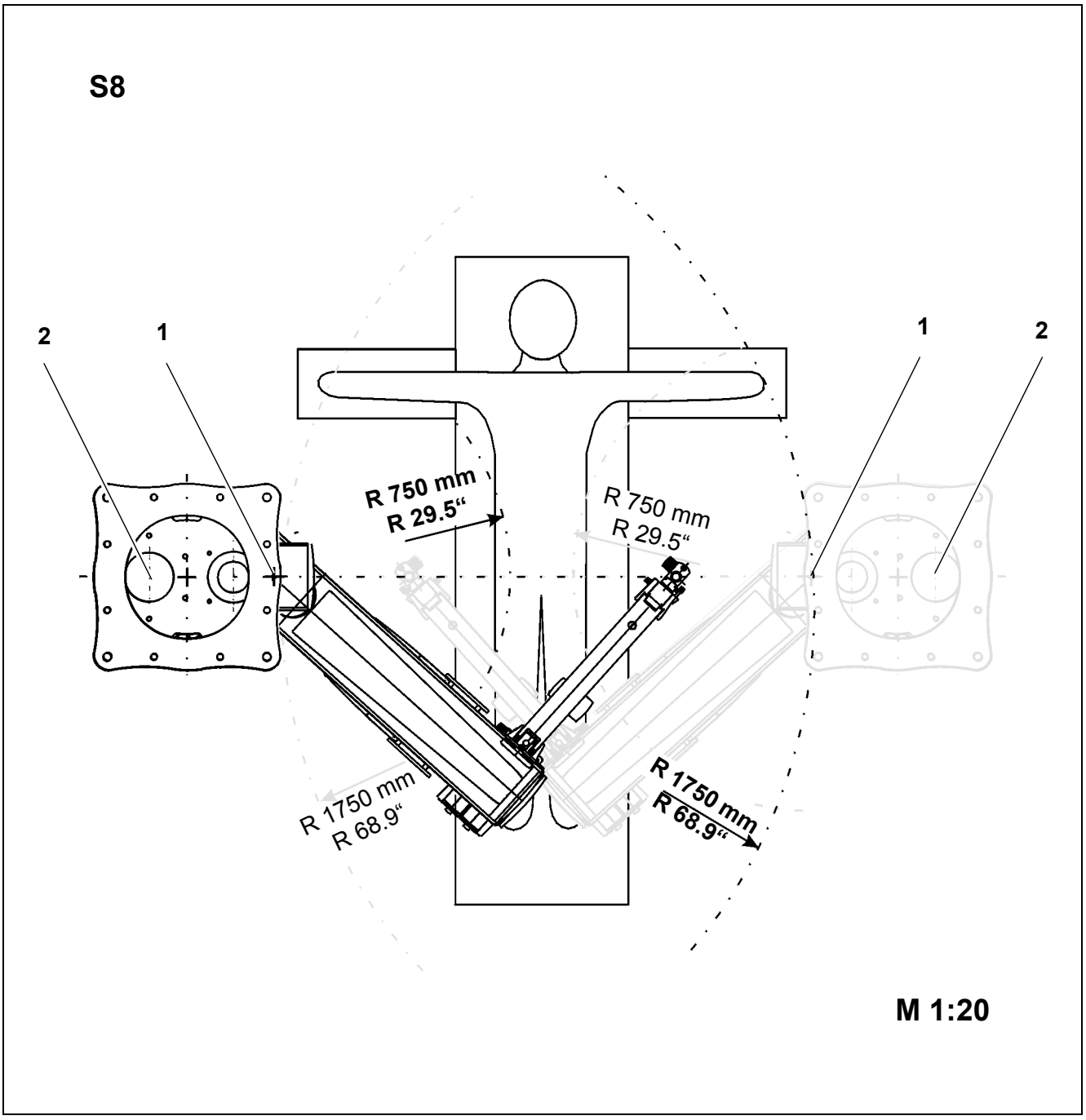
Key for the following drawings

1 Pivot point of the ceiling mount

2 Flange area for an accessory carrier

Recommended installation position for P&R, Hand

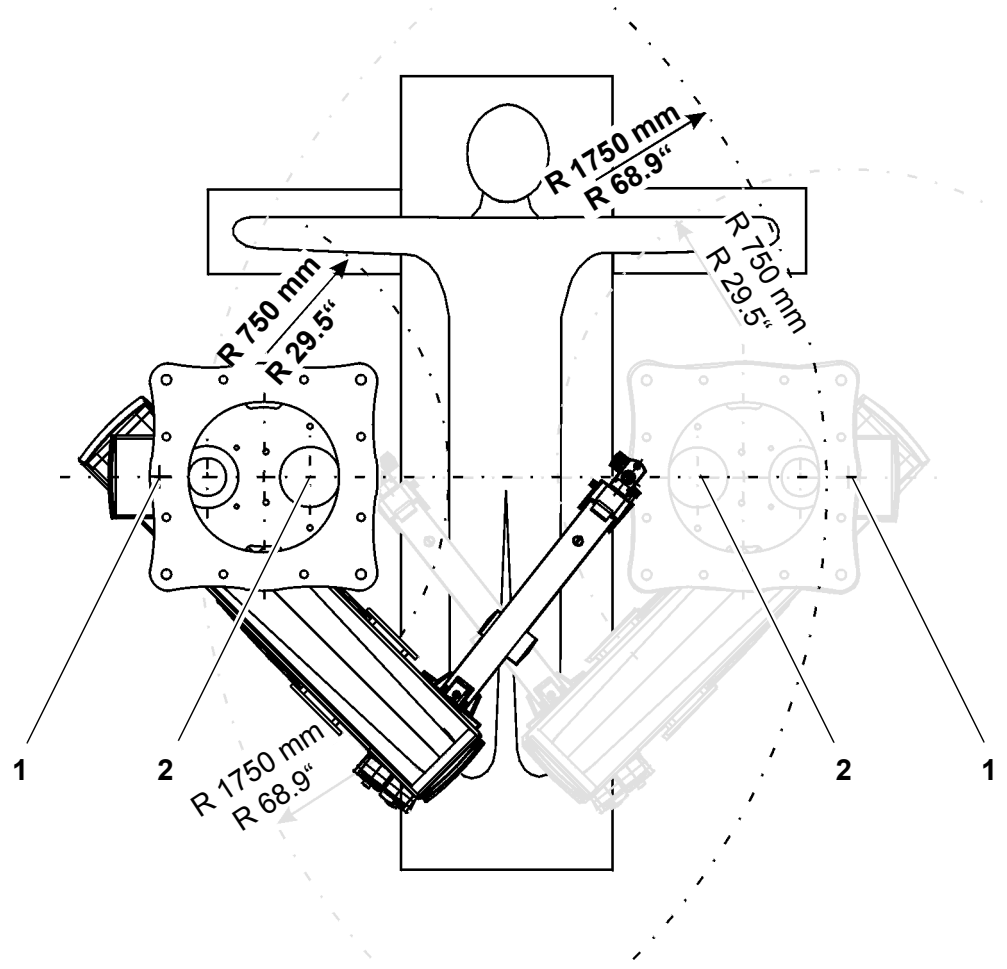
S8 ceiling mount positioned laterally to the operating table, approximately midway along the table. Flange area for accessory carrier (2) in outward position.
Preferable if OR illuminators are mounted separately.



Recommended installation position for P&R, Hand

S8 ceiling mount positioned laterally to the operating table, approximately midway along the table. Flange area for accessory carrier (2) in inward position.
Preferable if OR illuminators are mounted on the flange tube.

S8



M 1:20

Installation position for Neuro, Spine, Uro and Gyn

The S8 ceiling mount is used for the disciplines of neurology, spine, urology and gynecology.

The installation positions recommended in this chapter are also suitable for ENT, with certain restrictions.

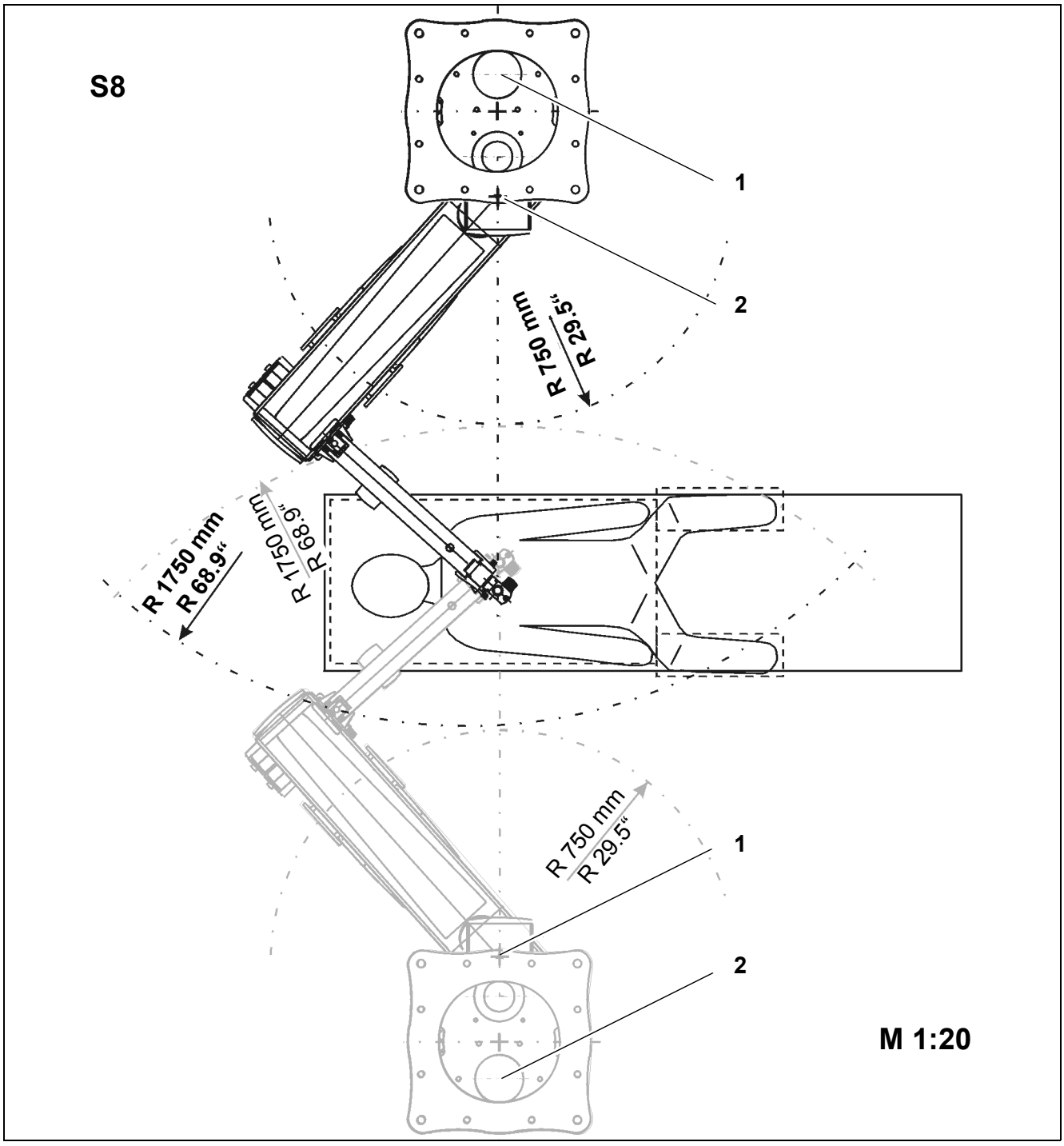
Key for the following drawings

1 Pivot point of the ceiling mount

2 Flange area for an accessory carrier

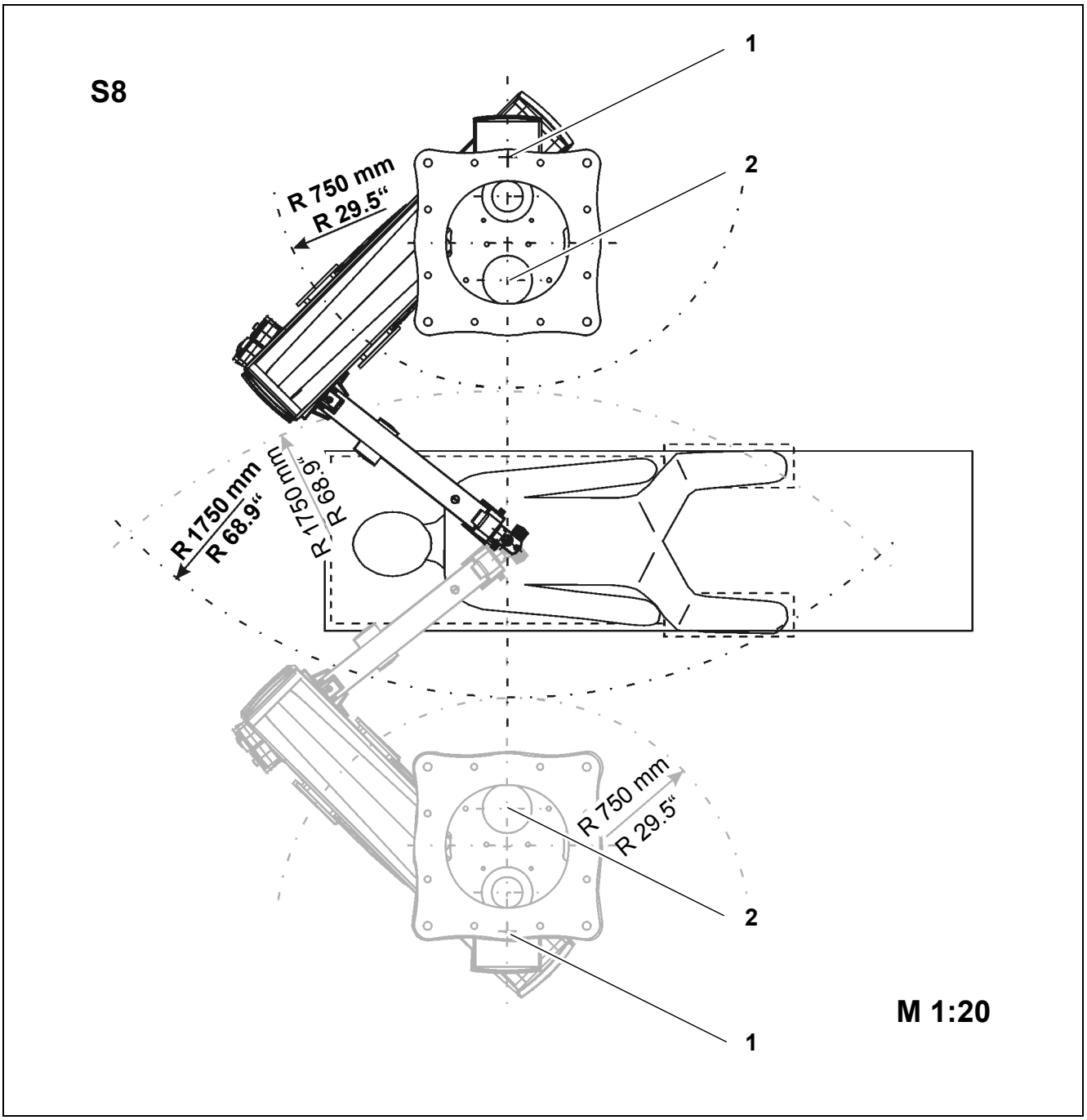
Recommended installation position for Neuro, Spine, Uro and Gyn

S8 ceiling mount positioned laterally to the operating table, approximately midway along the table. Flange area for accessory carrier (2) in outward position.



Recommended installation position for Neuro, Spine, Uro and Gyn

S8 ceiling mount positioned laterally to the operating table, approximately midway along the table. Flange area for accessory carrier (2) in inward position.
Preferable if OR illuminators are mounted on the flange tube.



Installation on an existing substructure

Installation options

If certain requirements are met, the S8 and S81 ceiling mounts can be installed on existing substructures provided for the S23, EMD2, S5, S51, S6 or S61 ceiling mount.

A special mounting kit is available for installing the S8 and S81 ceiling mounts on existing substructures (pre-installation sets of earlier ceiling mounts). A major part of the special mounting kit is the adapter plate. In this application, the adapter plate replaces the mount flange included in the standard delivery package of the ceiling mount.

The disciplines concerned are ophthalmic surgery, ENT surgery and P&R surgery.

Note:
Use this special mounting kit only if the pre-installation set for new installations (Cat. No. 1078-181) cannot be installed in the OR.
Only the pre-installation set for new installations ensures the typical working distances (microscope axis - pivot axis 1) of 1,250 mm (49.2") for the S8 ceiling mount or 1,000 mm (39.4") for the S81 ceiling mount, see page 21 and page 23.

Working ranges

The EMD2 and S23 ceiling mounts have been designed for an optimum working distance (center of mount flange to microscope axis) of 650 mm (25.6"). With a stationary operating table, working ranges of 900 mm (35.4") can be achieved if the adapter plate is rotated through 180°. If, in addition, the adapter plate is mounted with an offset of 90 mm (3.5"), the working range can be increased to 990 mm (39").

Note:
The recommended typical working ranges (= distance of pivot axis 1 to microscope axis) for the S8 S81 ceiling mounts are:

– 1,250 mm ± 500 mm (49.2 ± 19.7") for the S8 ceiling mount.

– 1,000 mm ± 400 mm (39.4" ± 15.7") for the S81 ceiling mount.

This means that an S8 ceiling mount will be at its rear mechanical limit position in this type of installation, see illustration on page 102.

Mounting options

Using the adapter plate, the S8 or S81 ceiling mount can be mounted on:

- existing intermediate piece (305658-0000.000) of an S23 or EMD2 ceiling mount, with the adapter plate in a laterally offset position and the electrical components mounted on the mounting bracket.
- existing intermediate piece (305658-0000.000) of an S23 or EMD2 ceiling mount, with the adapter plate in a centered position and optionally:
  - electrical components mounted on the mounting bracket or
  - electrical components mounted on the adapter plate.
- existing ZDK intermediate piece (305658-0000.000) of an S5, S51, S6 or S61 ceiling mount, and optionally:
  - electrical components mounted on the mounting bracket or
  - electrical components mounted on the adapter plate.
- existing ceiling track mount (305620-0000.000) of the S23 ceiling mount, with electrical components mounted on the adapter plate.

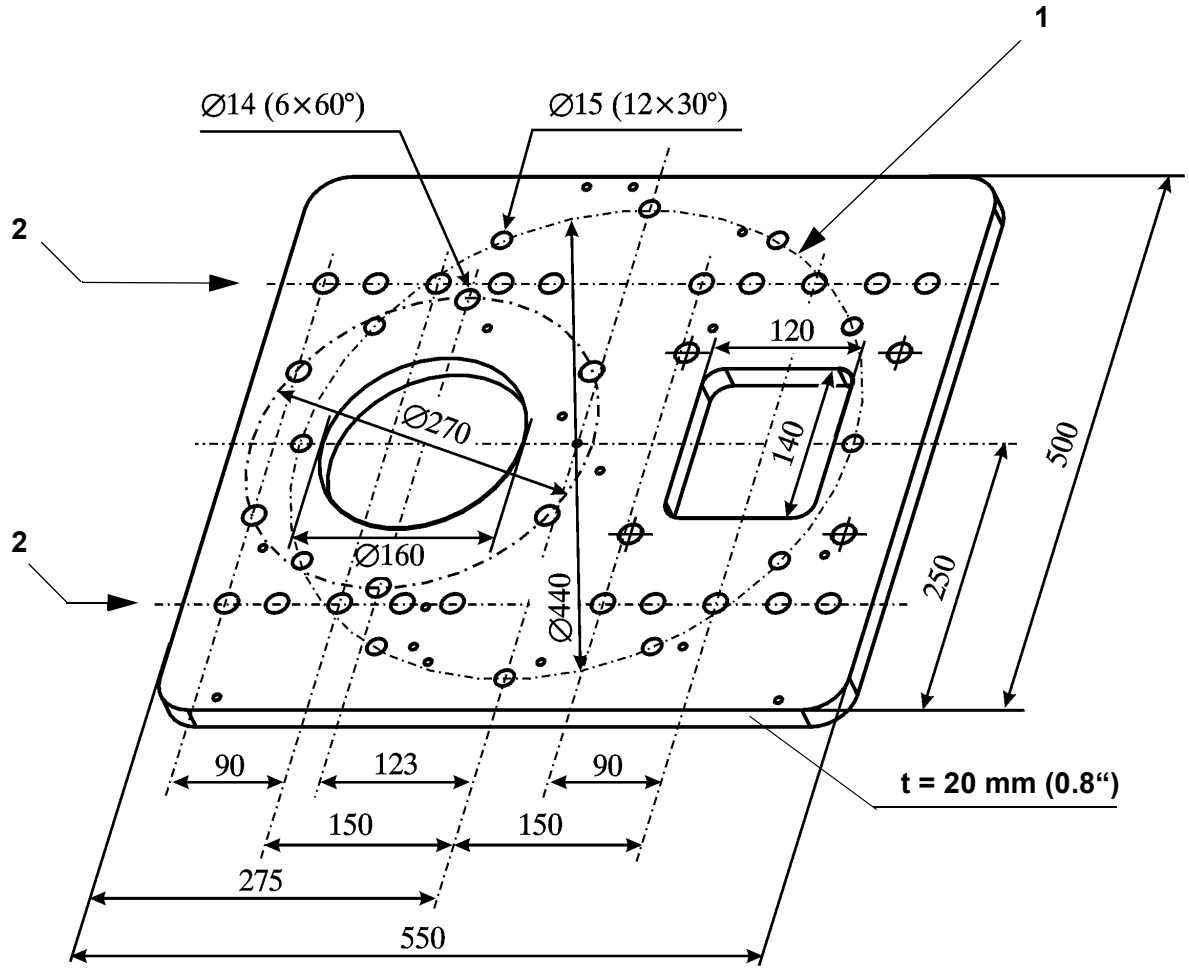
The different mounting options are described in more detail in the following.

Adapter plate (1071-924)

1 Hole circle
The hole circle with dia. 440 mm (17.3") has been provided for the installation on an existing ZDK intermediate piece (305942-9103.000) of the S5, S51, S6 or S61 ceiling mount.

2 Rows of bores
The rows of bores have been provided for the installation on an existing intermediate piece (305658-0000.000) of the S23 or EMD2 ceiling mount and for the installation on an existing ceiling track mount of the S23 ceiling mount.
The adapter plate can also be mounted with a 90 mm (3.5") lateral offset on the intermediate piece of the S23 or EMD2 ceiling mount.

t = 20 mm (0.8"), thickness of the adapter plate



mm	Inch
Ø14	Ø0.55
Ø15	Ø0.6
Ø270	Ø10.6
Ø160	Ø6.3
Ø440	Ø17.3
120	4.7
140	5.5

mm	Inch
250	9.8
500	19.7
90	3.5
123	4.8
150	5.9
275	10.8
550	21.7

Installation on an intermediate piece of S23 or EMD2

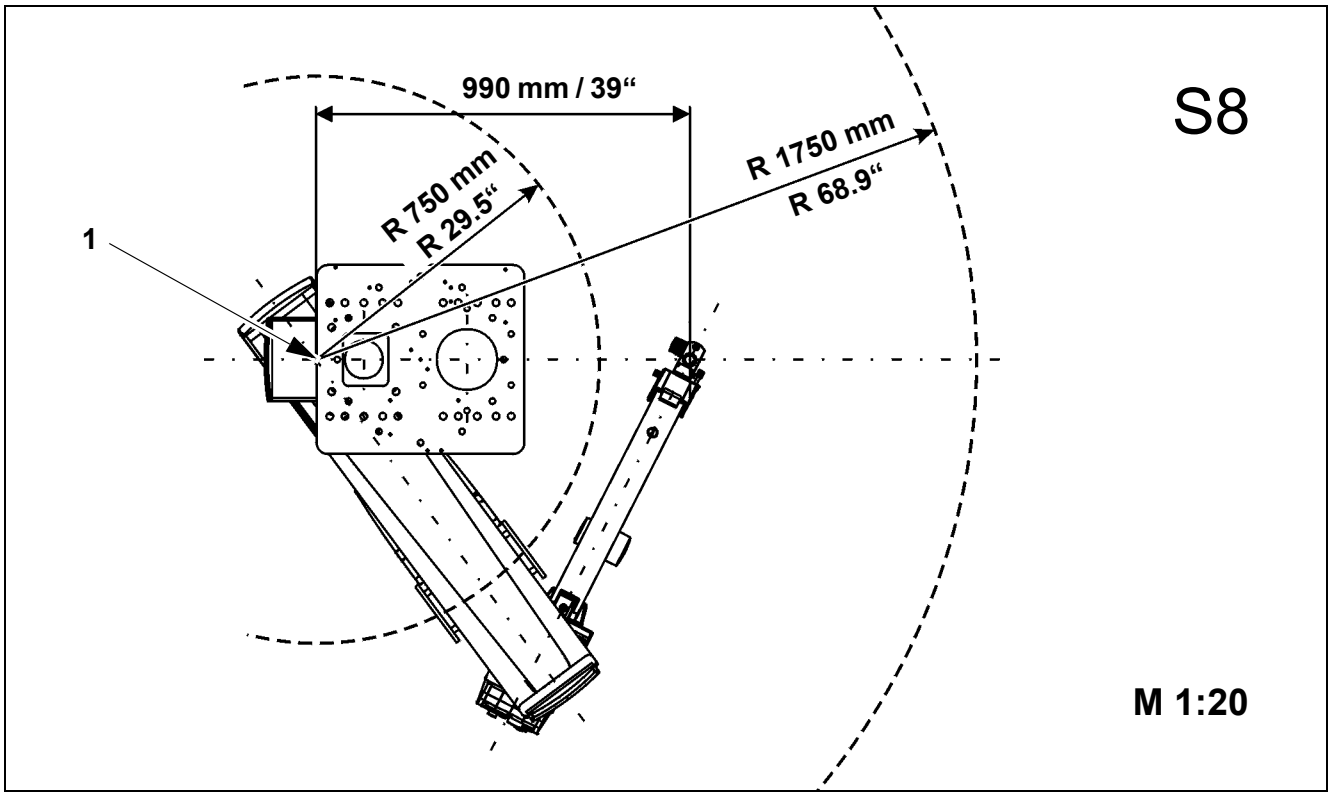
Mounting the adapter plate in an offset position

Adapter plate mounted with a 90 mm (3.5") lateral offset

The following two illustrations show an adapter plate mounted with a 90 mm (3.5") lateral offset. The working range for the surgical microscope is located between the circles shown in dashed lines. Therefore, you should check for the installation of an S8 or S81 ceiling mount whether the optimum working range can be obtained by repositioning the operating table: 1,250 mm (49.2") with S8, and 1,000 mm (39.4") with S81.

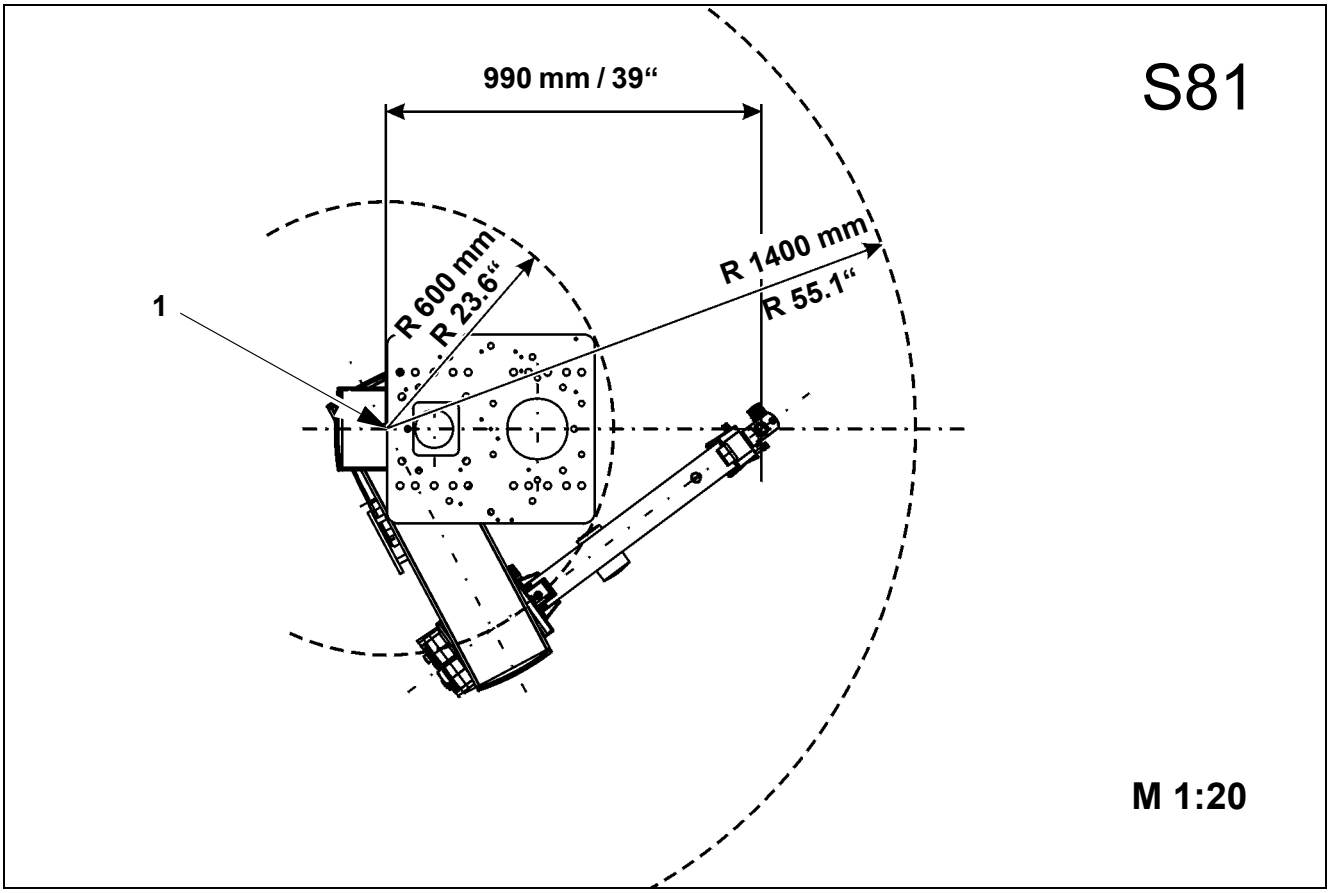
Working range of the S8 ceiling mount with a 90 mm (3.5") lateral offset of the adapter plate

1 Pivot axis
The radii of the working range
R = 750 mm (29.5") and R = 1,750 mm (68.9") refer to this pivot axis.



Working range of the S81 ceiling mount with a 90 mm (3.5") lateral offset of the adapter plate

1 Pivot axis
The radii of the working range
R = 600 mm (23.6") and R = 1,400 mm (55.1") refer to this pivot axis.



Adapter plate mounted with a lateral offset and electrical components mounted on the mounting bracket

Note:
The mounting bracket can only be used to mount the electrical components on intermediate piece (1) if intermediate piece (1) has a clearance of at least 310 mm (12.2").

1 Intermediate piece of S23 or EMD2 ceiling mount (305658-0000.000)

2 False ceiling

3 Adapter plate

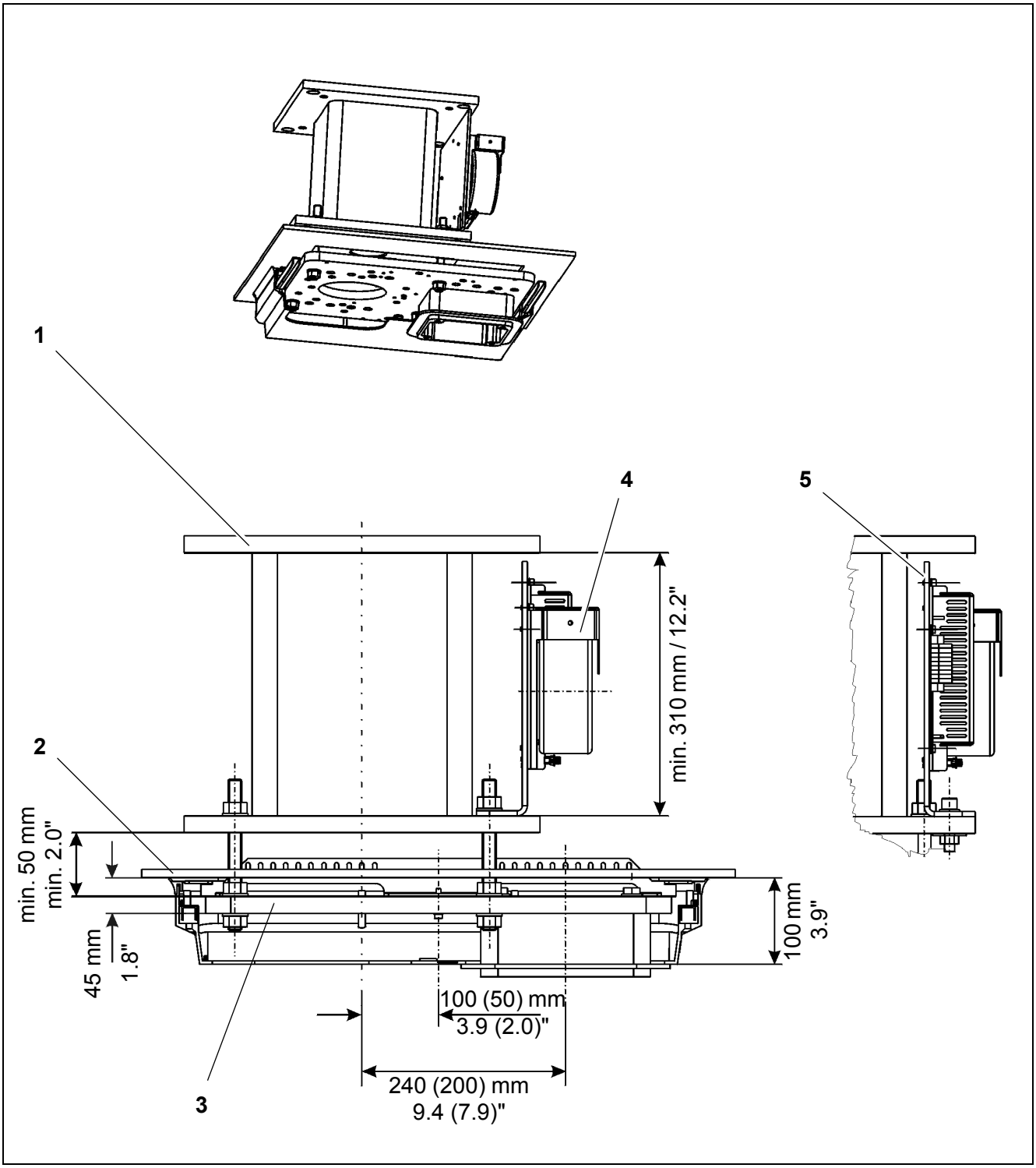
4 Electrical components mounted on mounting bracket.

5 Mounting bracket
The mounting bracket can also be mounted in a position rotated through 180°.

Caution:
When ordering an S81 ceiling mount for installation on an existing intermediate piece, you must determine and specify dimension B in the "Order sheet for S81 ceiling mounts in ORs with false ceilings“ (see page 55) as follows:

- Measure the distance between the bottom surface of the intermediate piece to the floor.
- Subtract the probable distance between the adapter plate and the intermediate piece and enter the value obtained as dimension B in the order sheet.

The probable distance of the adapter plate from the intermediate piece will be at least 50 mm (1.97"), if the electrical components are attached to the side of the mounting bracket.


1
4
5
2
min. 310 mm / 12.2"
min. 50 mm
min. 2.0"
45 mm
1.8"
100 mm
3.9"
100 (50) mm
3.9 (2.0)"
240 (200) mm
9.4 (7.9)"
3

Mounting the adapter plate in a centered position

Electrical components mounted on the mounting bracket

Note:
The mounting bracket can only be used to mount the electrical components on intermediate piece (1) if intermediate piece (1) has a clearance of at least 310 mm (12.2").
If necessary, the electrical components can also be mounted on adapter plate (3).

1 Intermediate piece of S23 or EMD2 ceiling mount (305658-0000.000)

2 False ceiling

3 Adapter plate

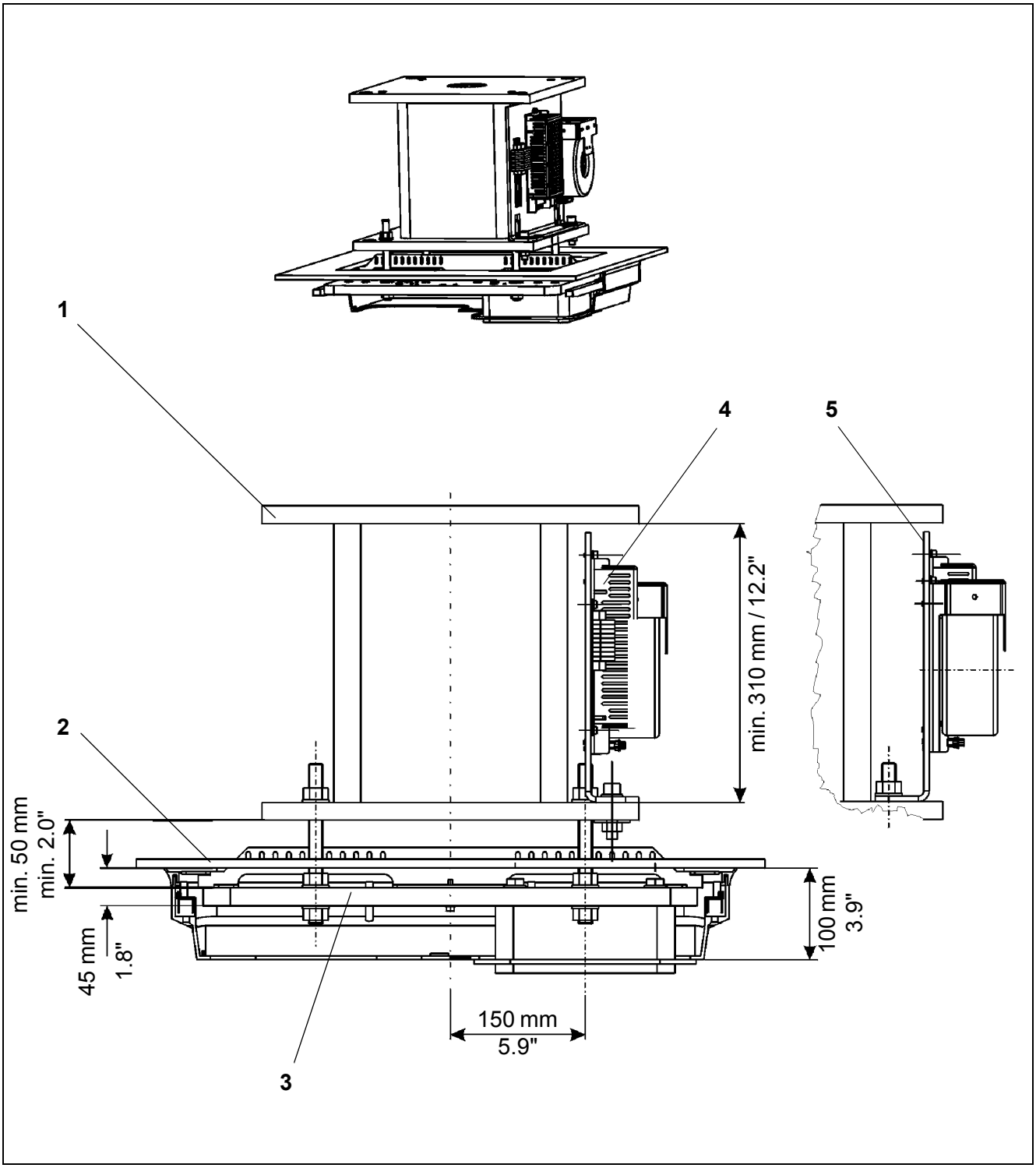
4 Electrical components mounted on mounting bracket

5 Mounting bracket
The mounting bracket can also be mounted in a position rotated through 180°.

Caution:
When ordering an S81 ceiling mount for installation on an existing intermediate piece, you must determine and specify dimension B in the "Order sheet for S81 ceiling mounts in ORs with false ceilings“ (see page 55) as follows:

- Measure the distance between the bottom surface of the intermediate piece to the floor.
- Subtract the probable distance between the adapter plate and the intermediate piece and enter the value obtained as dimension B in the order sheet.

The probable distance of the adapter plate from the intermediate piece will be at least 50 mm (1.97"), if the electrical components are attached to the side of the mounting bracket.


1
2
3
4
5
min. 310 mm / 12.2"
min. 50 mm
min. 2.0"
45 mm
1.8"
100 mm
3.9"
150 mm
5.9"

Electrical components mounted on the adapter plate

Note:
The electrical components can only be mounted on adapter plate (3) if the clearance between intermediate piece (1) and adapter plate (3) is at least 108 mm (4.3").
If necessary, the electrical components can also be mounted at the side of intermediate piece (1) using the mounting bracket.

1 Intermediate piece of S23 or EMD2 ceiling mount (305658-0000.000)

2 False ceiling

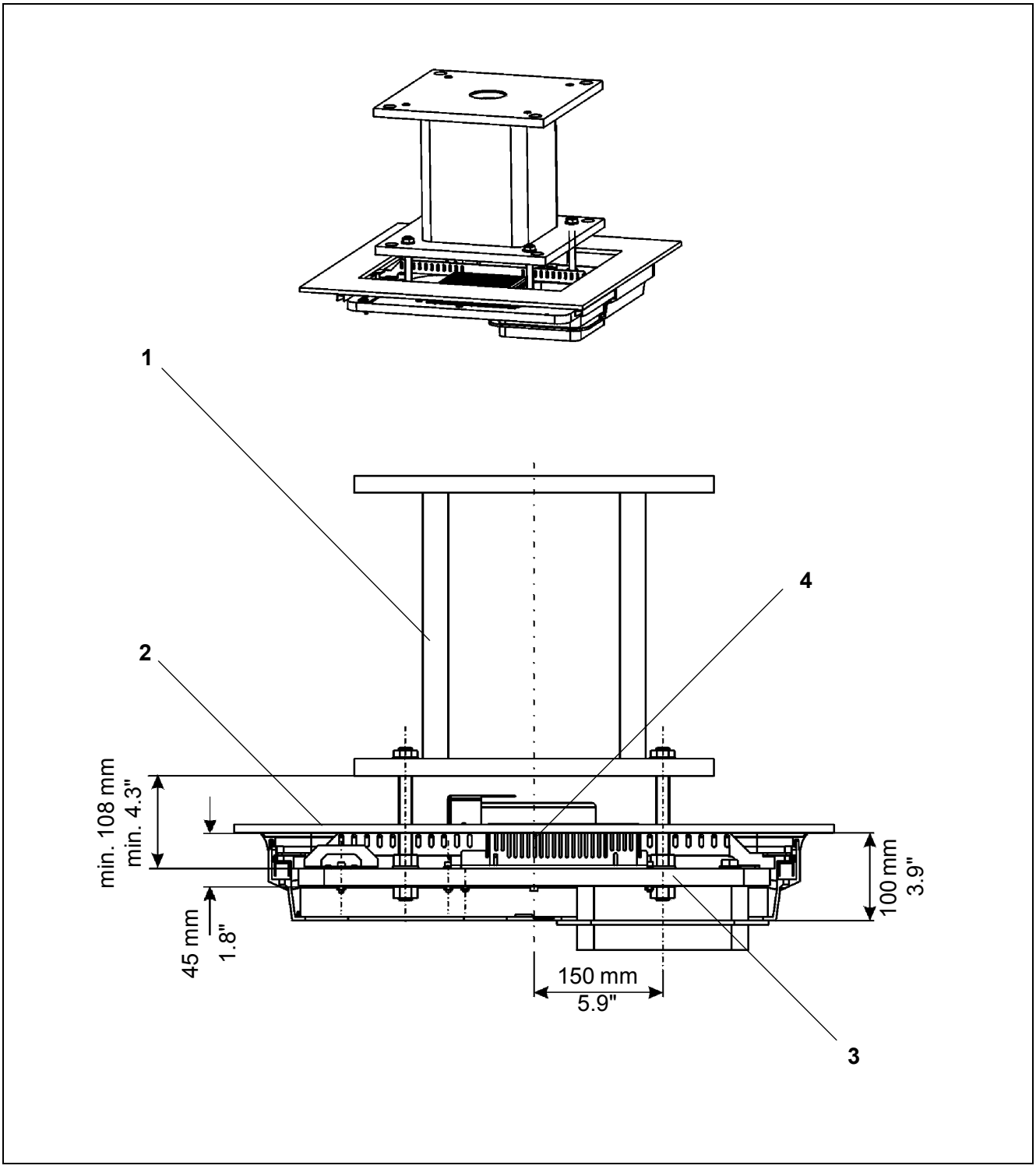
3 Adapter plate

4 Electrical components mounted on adapter plate.

Caution:
When ordering an S81 ceiling mount for installation on an existing intermediate piece, you must determine and specify dimension B in the "Order sheet for S81 ceiling mounts in ORs with false ceilings“ (see page 55) as follows:

- Measure the distance between the bottom surface of the intermediate piece to the floor.
- Subtract the probable distance between the adapter plate and the intermediate piece and enter the value obtained as dimension B in the order sheet.

The probable distance of the adapter plate from the intermediate piece will be at least 108 mm (4.3"), if the electrical components are mounted on the adapter plate.


1
2
4
3
min. 108 mm
min. 4.3"
45 mm
1.8"
100 mm
3.9"
150 mm
5.9"

Installation on an existing ZDK intermediate piece

The ZDK intermediate piece (305942-9103.000) was used to install the S5, S51, S6 and S61 ceiling mounts.

Mounting electrical components on the mounting bracket

Note:
The mounting bracket can only be used to mount the electrical components on intermediate piece (1) if intermediate piece (1) has a clearance of at least 310 mm (12.2").
Otherwise, the electrical components can also be mounted on adapter plate (3).

.

1 ZDK intermediate piece (305942-9103.000) of S5, S51, S6 and S61 ceiling mounts

2 False ceiling

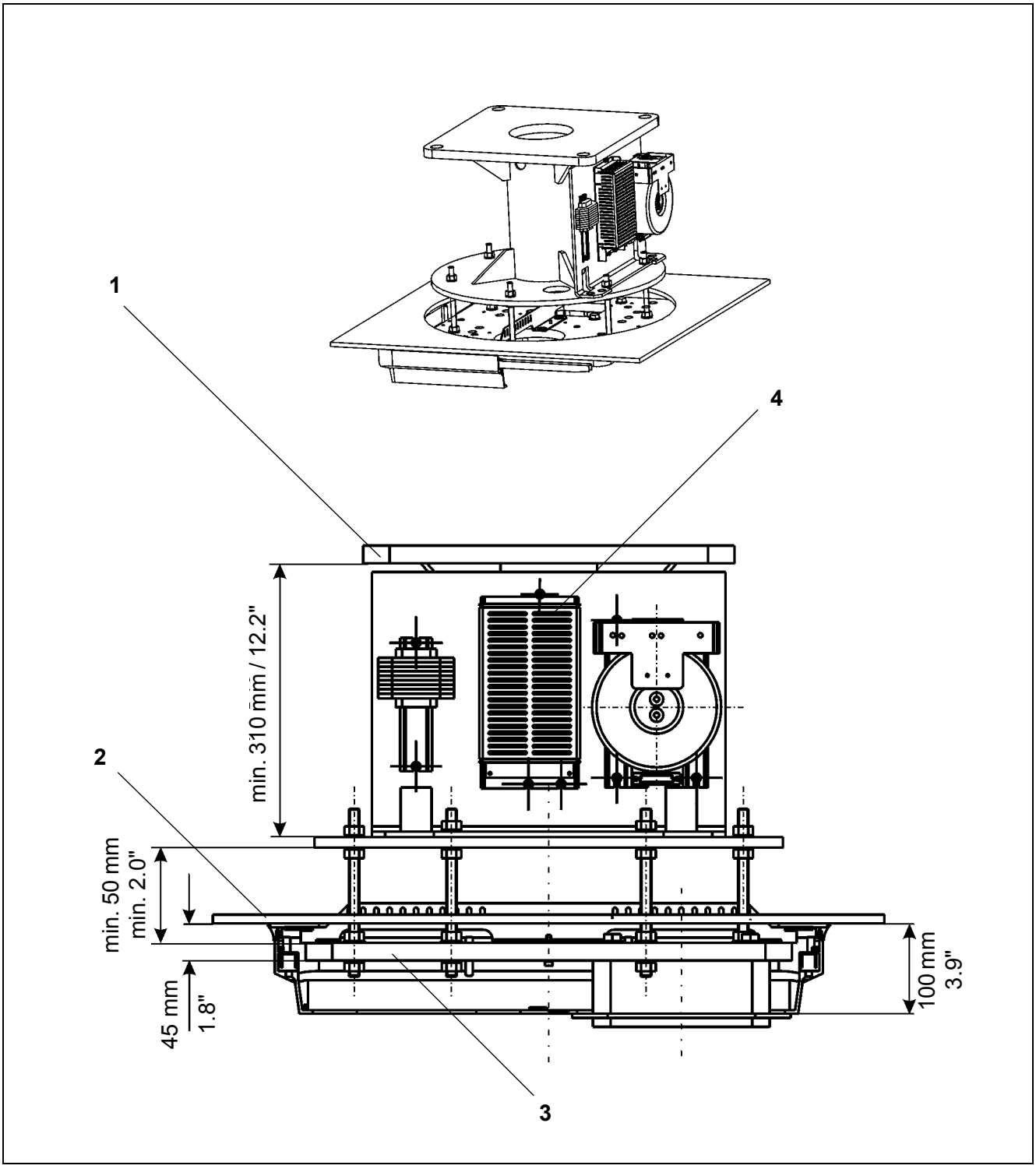
3 Adapter plate

4 Electrical components mounted on mounting bracket.

Caution:
When ordering an S81 ceiling mount for installation on an existing intermediate piece, you must determine and specify dimension B in the "Order sheet for S81 ceiling mounts in ORs with false ceilings“ (see page 55) as follows:

- Measure the distance between the bottom surface of the intermediate piece to the floor.
- Subtract the probable distance between the adapter plate and the intermediate piece and enter the value obtained as dimension B in the order sheet.

The probable distance of the adapter plate from the intermediate piece will be at least 50 mm (1.97"), if the electrical components are attached to the side of the mounting bracket.


1
4
2
3
min. 310 mm / 12.2"
min. 50 mm
min. 2.0"
45 mm
1.8"
100 mm
3.9"

Electrical components mounted on the adapter plate

Note:
The electrical components can only be mounted on adapter plate (3) if the clearance between intermediate piece (1) and adapter plate (3) is at least 108 mm (4.3").
If necessary, the electrical components can also be mounted on the side of intermediate piece (1) using the mounting bracket (1124-211).

1 ZDK intermediate piece (305942-9103.000) of S5, S51, S6 and S61 ceiling mounts

2 False ceiling

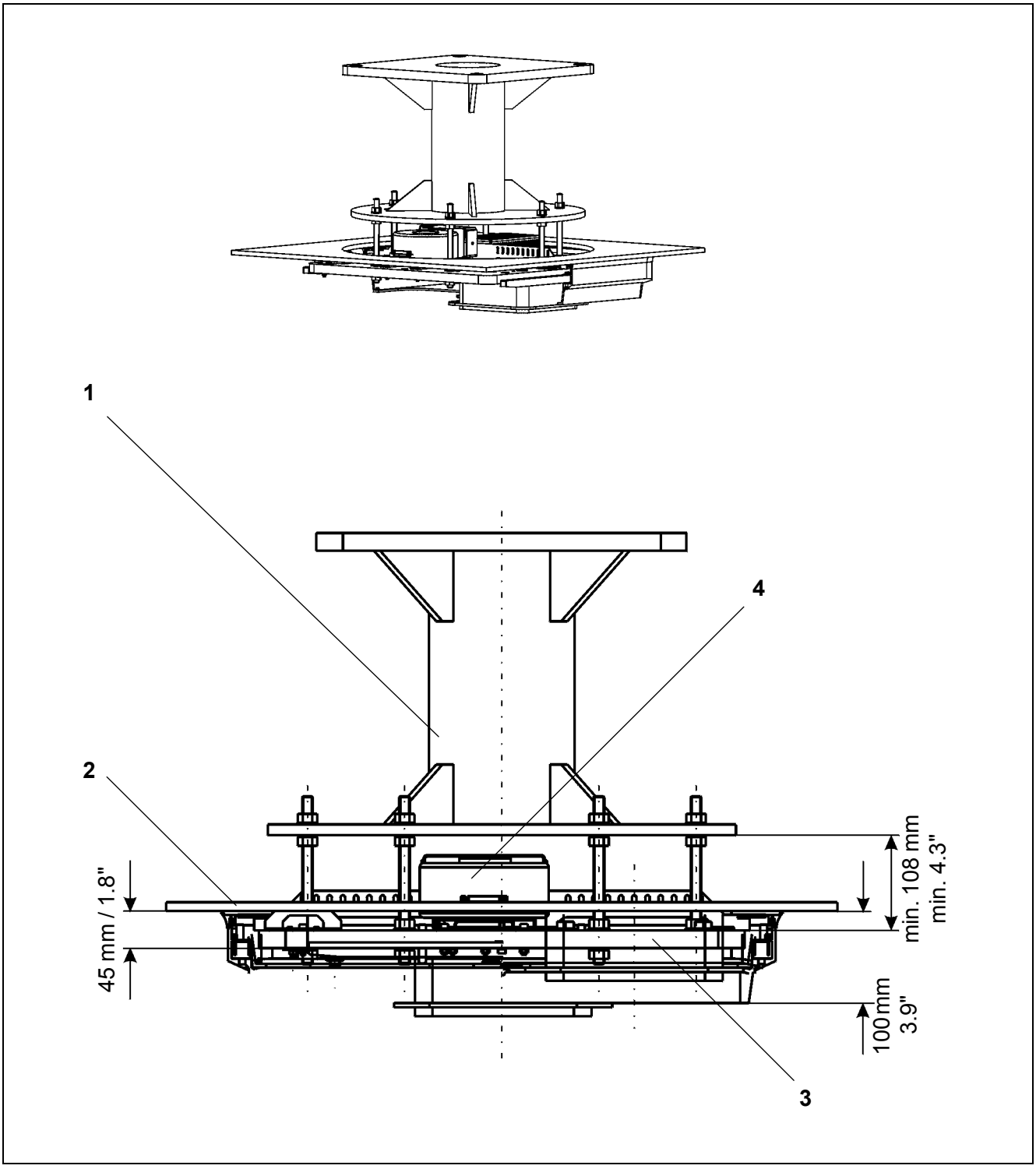
3 Adapter plate

4 Electrical components mounted on adapter plate.

Caution:
When ordering an S81 ceiling mount for installation on an existing intermediate piece, you must determine and specify dimension B in the "Order sheet for S81 ceiling mounts in ORs with false ceilings“ (see page 55) as follows:

- Measure the distance between the bottom surface of the intermediate piece to the floor.
- Subtract the probable distance between the adapter plate and the intermediate piece and enter the value obtained as dimension B in the order sheet.

The probable distance of the adapter plate from the intermediate piece will be at least 108 mm (4.3"), if the electrical components are mounted on the adapter plate.


1
2
4
3
45 mm / 1.8"
min. 108 mm
min. 4.3"
100 mm
3.9"

Installation on ceiling track mount

You can install the S81 ceiling mount on an existing ceiling track mount. The S8 ceiling mount cannot be installed on a ceiling track mount.

The following is required for installing an S81 ceiling mount on an existing ceiling track mount:

– Kit for mounting S8/S81 CM on existing ceiling anchor plate (1120-925)

– and, in addition, the "Kit for mounting S81 on ceiling track mount" (1144-462).

Note:
Use the order sheet on page 123 to order the S81 ceiling mount for installation on an existing ceiling track mount.

300 mm (11.8") ceiling panel extension

Ceiling panel extension (1) is required to completely cover any intermediate pieces of the S23, EMD2, S5, S51, S6 or S61 ceiling mount protruding from the false ceiling.

To allow this, a 300 mm (11.8") ceiling panel extension and the relevant mounting instructions (1177-632) are included in each "Kit for mounting S8/S81 CM on existing ceiling anchor plate" (1120-925).

An installer will cut the 300 mm (11.8") ceiling panel extension to the length required on site and install it as per the mounting instructions (1177-632).

1 300 mm (11.8") ceiling panel extension (1177-632)

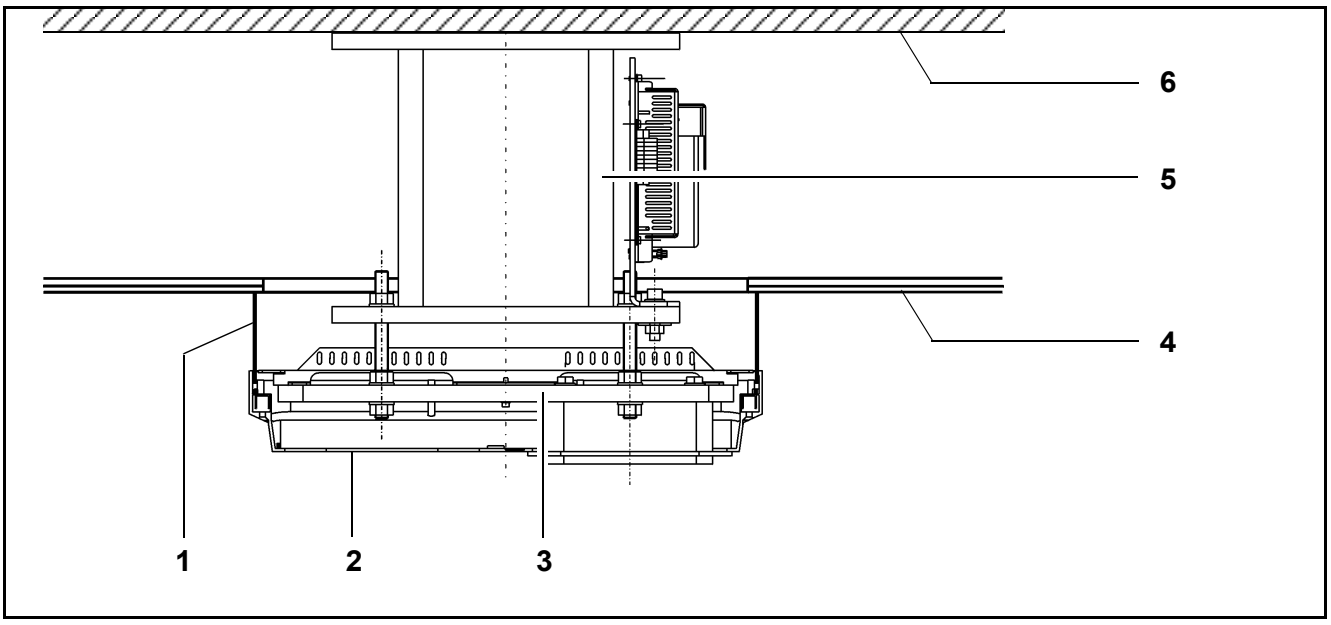
2 Ceiling panel for S8 / S81 ceiling mounts (1083-804)

3 Adapter plate (1071-924)

4 False ceiling

5 Intermediate piece of S23 or EMD2 ceiling mount
The intermediate piece of the S23 or EMD2 is shown here as an example. Ceiling panel extension (1) can also be used with the ZDK intermediate piece of the S5, S51, S6 or S61 ceiling mount.

6 Structural ceiling



On-site preparations

Customer's responsibilities

Note:
Zeiss service staff can install the ceiling mount only if all points of the following checklist applicable to the relevant installation conditions have been fulfilled.

Caution:

- Obtain the structural verification for an existing substructure from a structural engineer, i.e. make sure that the engineer confirms the effective strength of the existing anchors.
  Structural verification must be performed prior to the installation of the mount.
  Please add a copy of the "Confirmation of structural calculation" to your order (see page 119).
- On-site conditions also include building vibrations, which the structural engineer responsible must take into account right during the planning phase (see page 26).
  Obtain a written confirmation from your structural engineer stating that possible building vibrations have been taken into account (see page 119).
- If an existing substructure is to be used, make sure that the maximum inclination of the ceiling anchor plate under load does not exceed 0.2°.
- The structural engineer must check that no modifications have been made to the substructure since the original installation.
- Obtain a written confirmation from a structural engineer stating that the applicable national codes and regulations have been complied with.
- If any differences exist between the planning documents and the actual on-site situation, please inform your contact at Carl Zeiss or the planning expert prior to the installation of the ceiling flange or pre-installation set.
- Please note the information provided on page 104 for ordering an S81 ceiling mount for installation on an existing substructure (existing intermediate piece).

Warning!

- If an existing flange plate or intermediate piece must be exchanged, never re-use the old anchors. New anchor holes must be drilled. When calculating the effective strength of the new anchors, the structural engineer must take into account the weakening effect of the old holes in the ceiling.

Planning the installation

- Inspect the mounting components supplied for completeness and damage.
- Prior to the installation of a ceiling mount, you must always check that the actual installation conditions - in particular the room height - correspond to the specifications in the drawing.
- Two installers are required for mounting the mounting kit required for installation on existing ceiling anchors.

Constructional requirements

The actual load on the ceiling depends on a large number of different factors. The requirements to be met by the ceiling or substructure result from the addition of perpendicular forces and torques produced by the suspension system and accessories. These are the forces to be transmitted into the structural ceiling via the ceiling anchors.
The column must be aligned in a vertical position (max. deviation ± 0.5°).

Forces and torques

Warning!
Your structural engineer must ensure in each individual case that the existing substructure and structural ceiling have a sufficient load capacity for the forces and torques listed below. He must also take into account any additional loads on the ceiling and add an appropriate safety margin, and must observe the applicable national codes and regulations.

Caution:
- The perpendicular forces and torques specified below include an additional load of 100 kg (220 lb), which is generated when a person hangs on the end of the suspension arm (or the microscope). Further safety margins have **not** been incorporated.
- The perpendicular forces and torques have been calculated on the basis of the maximum permissible load on the suspension arm.

S8 or S81 ceiling mount
For an S8 or S81 ceiling mount alone (without accessories on the accessory interface), the existing substructure and the structural ceiling must have the following load capacity:

- Perpendicular force: minimum 2500 N (565 lbf)
- Torque: minimum 3000 Nm (2215 lbf.ft)

Confirmation of the structural calculation and execution of installation

Sales order no.: .....

Customer address /
Delivery address: .....

.....

.....

By signing below, the following persons confirm that they have performed their work in a proper and orderly way:

The **structural engineer** for

- the selection and layout of the installation site, taking possible building vibrations into account
- the structural calculation, taking into account the applicable national regulations and the planning manual
- the structural checking of an existing substructure
- the structural calculation of a substructure built on site
- the final checking and release of the structural calculations:

Name and address of
the structural engineer: .....

.....

.....

....

Date Signature

The **installer** for
the proper mounting of the pre-installation set or the ceiling or wall flange from Carl Zeiss**:**

Name and address of
the executing company
and installer's name: .....

.....

.....

.....

....

Date Signature

Ordering data

Mounting an S8/S81 ceiling mount on an existing intermediate piece

Description	Cat.No.
Kit for mounting an S8/S81 CM on existing ceiling anchor plate	1120-925

The mounting kit (1120-925) includes:

– adapter plate (1071-924)

– mounting bracket (1124-211).

– 300 mm (11.8") ceiling panel extension (1177-632)

Caution:
When ordering an S81 ceiling mount for installation on an existing intermediate piece, you must determine and specify dimension B in the "Order sheet for S81 ceiling mounts in ORs with false ceilings“ (see page 55) as follows:

- Measure the distance between the bottom surface of the intermediate piece to the floor.
- Subtract the probable distance between the adapter plate and the intermediate piece and enter the value obtained as dimension B in the order sheet.

Mounting an S81 ceiling mount on an existing ceiling track mount

Note:
Please note that the relevant dimensions have to be entered in the following drawing for each purchase order.

- Enter the data and enclose a copy of the drawing with your purchase order.

Description	Cat.No.
Kit for mounting an S8/S81 CM on existing ceiling anchor plate	1120-925
Kit for installing an S81 on a ceiling track mount	1144-462

Controlling the ceiling track mount using a hand switch

The "Kit for installing an S81 on a ceiling track mount (1144-462)" includes a hand switch.

- If you wish to operate the ceiling track mount using this hand switch, please also order the instrument socket (1141-820) for the connection of this hand switch.

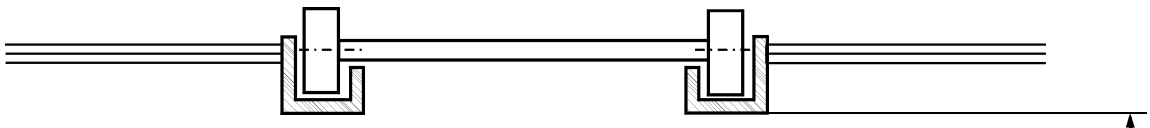
B Distance from the bottom surface of the ceiling track mount (bottom surface of cover) from the floor

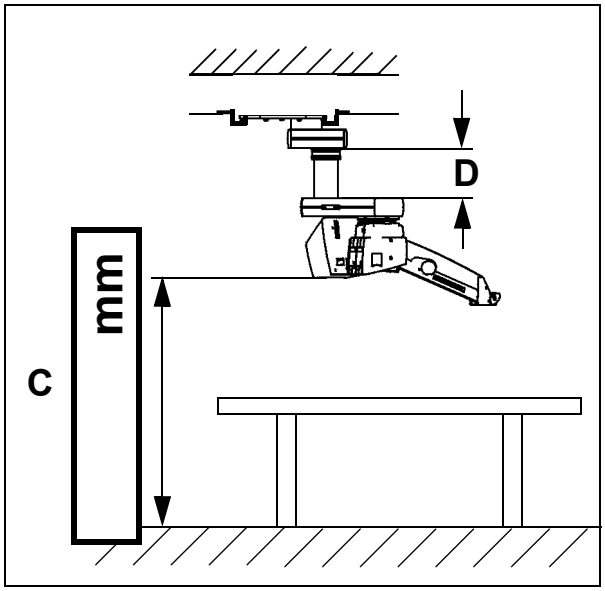
C Distance from floor
Depending on the discipline, we recommend using different distances from the floor:

- ENT 1,650 mm (65")
- ophthalmology 1,800 mm (70.9")
- reconstructive and plastic surgery 1,800 mm (70.9")
- others 1,650 mm (65")

D Column length
The dimension is calculated using the formula:
D = B - C - 910 mm (35.8").

Order sheet for S81 ceiling mount on ceiling track mount





Column length:

D = B - C - 910 mm

D = _____ **mm**

min 40 mm, max 800 mm

B _____ **mm**

Dimensions (inches):

B = _____ "

C = _____ "

Column length:

D = B - C - 35.8“

D = _____ "

min 1.6“, max 31.5“

Index

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